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THE
JOURNAL
OF THE
ANTHROPOLOGICAL INSTITUTE
OF
GREAT BRITAIN AND IRELAND.



VOL. V.

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J. R. A. I.

LONDON:

PUBLISHED FOR

The Anthropological Institute of Great Britain and Ireland,

BY

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1876.

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Fig. 1.



Fig. 2.



Fig. 3.



Fig. 4.

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THE JOURNAL
OF THE
ANTHROPOLOGICAL INSTITUTE
OF
GREAT BRITAIN AND IRELAND.

FEBRUARY 9TH, 1875.

Colonel A. LANE FOX, F.S.A., *President, in the Chair.*

The minutes of the previous ordinary meeting were read and confirmed.

The following new members were announced :—THOMAS J. GREENFIELD, Esq., 6, Pump Court, Temple; JOHN COLLINSON, Esq., 3, Lightfoot Road, Hornsey; J. D. B. GRIBBLE, Esq., Cuddupah, Madras; and ROBERT R. JONES, Esq., Grosvenor Club, Pimlico.

The following list of presents was read, and the thanks of the meeting were voted to the respective donors.

FOR THE LIBRARY.

From the EDITOR.—*Revue Scientifique*. Nos. 28-32, 1875.

From MESSRS. LONGMANS & Co.—*The Native Races of the Pacific States of N. America*. Vol. I. (Wild Tribes). By H. H. Bancroft.

From the SOCIETY.—*Bulletin de la Société Impériale des Naturalistes de Moscou*. No. 2, 1874.

From the SMITHSONIAN INSTITUTION.—*Smithsonian Contributions to Knowledge*. Vol. XIX. *Smithsonian Miscellaneous Collections*. Vols. XI. and XII.

From the SOCIETY.—*Bulletin de la Société d'Anthropologie de Paris*. Vol. IX. No. 3.

From the AUTHOR.—*Sur l'Origine et la Repartition de la Langue Basque, Basques Français et Basques Espagnols*. By Dr. Paul Broca.

From the SOCIETY.—*Proceedings of the Royal Society*. Vol. XXIII. No. 157.

From the EDITOR.—*Nature* (to date).

From the SOCIETY.—Proceedings of the Philosophical Society of Glasgow, 1874.

From the SOCIETY.—Transactions of the Society of Biblical Archaeology. Vol. III. Part I.

From the SOCIETY.—Proceedings of the Royal Geographical Society. Vol. XIX. No. 1.

From the Editor.—Matériaux pour l'Histoire Primitive et Naturelle de l'Homme. Vol. V. No. 9.

Professor W. BOYD DAWKINS, F.R.S., exhibited a series of stone mining tools from Alderley Edge, and made the following remarks:—

On the STONE MINING TOOLS from ALDERLEY EDGE, CHESHIRE.

By Professor W. BOYD DAWKINS, M.A., F.R.S.* [With Plate i.]

IN May, 1874, Mr. H. Wilde and myself happened to take a walk to the new excavations which were in progress at the copper mines at Alderley Edge, which penetrate the rock on the east side of "the Street Road," leading to Alderley. The Lower Keuper sandstone in that place is impregnated with carbonate of copper, in search of which tunnels had been driven into the base of the hill, in the main parallel to the strata, having there a dip to the west of about 29°. In following the ore from the deep upwards the miners had worked their way to the surface, on the hillside immediately above the heaps of refuse near the reducing tanks, and laid bare a considerable portion of the rock. While walking over this surface, which was fantastically hollowed, a worked stone happened to catch my eye; and when we examined the stones lying about in the hollows we saw at once that a large number had been used in mining operations; and of these, owing to the kindness of the manager and the captain of the mine, we were able to secure thirty-five, which are now lodged in the Museum at the Owens College.

These mining tools are divisible into three classes: 1, the hammers with a simple groove round the middle for the retention of the withy which formed the handle (Plate i. fig. 1); 2, the tools which, besides this groove, have one of their ends also grooved for the reception of another withy, and thus were prevented from slipping when a blow was struck (figs. 3 & 4); and lastly, there were two implements (fig. 2) which probably had been used as wedges, being possessed of an edge blunted by wear, and exhibiting marks of having been struck on the other. One of these has a surface which looks as if it had been glaciated,

* This abstract was prepared for the Manchester Lit. and Phil. Soc.

and the second, in shape very much like a celt, is remarkable for the clear evidence which its surface offers, that the groove around it for the reception of the withy was cut *after* the stone had been ground to its present shape, and probably long after, in consequence of the decomposition of the surface of grinding as compared with that of the groove.

All these implements were derived from the ice-borne stones of the boulder clay, of which they were merely picked specimens which happened to be useful for the special purpose of mining.

Subsequently, in the autumn of 1874, many more specimens were obtained by Col. Lane Fox and myself, through the kindness of Lord Stanley of Alderley and the manager of the mine, and we were able to make a careful examination of the conditions under which they were found. To pass over those which have been buried, the number which I have examined is considerably over one hundred, belonging to the three types mentioned above.

The rock where the tools were met with was hollowed out irregularly and evidently artificially, and to a depth, in some cases, of from 8 to 11 feet from the surface. And from an examination of the ground it was perfectly obvious that the ancient users of these tools had worked the metalliferous portions from above, without attempting to make galleries. The tools lay buried in the *débris* which had been thrown into the old surface workings after they had been discontinued, and which presented all the characters of "a wheelbarrow formation," and were found in the greatest abundance near the bottom.

Stone hammers of the kind mentioned above, and especially of the simple grooved class, are very widely distributed. They have been found equally in the ancient copper mines of Anglesea, of Spain and Portugal, and of Lake Superior. With these also the Egyptians worked the turquoise mines of Wady Magarah, in the Sinaitic peninsula. They undoubtedly represent one of the ruder and probably earlier stages in the art of mining. With the solitary exception offered by the turquoise mines at Magarah, they have only been discovered in old copper workings, and they may, therefore, be inferred to have been used in ancient times mainly for the extraction of that metal.

I will not venture to attempt to assign a date to the mining operations carried on at Alderley, when these implements were in use. In all the ancient mines, worked by the Romans, so far as I know, iron tools have alone been met with. Nor am I aware of any mines, of post-Roman date, in Europe which have been carried on with tools composed of any other material. It would, therefore, seem probable that they are of pre-Roman

age, and that they are of the class termed prehistoric by the archaeologists.

Nor is it absolutely certain what metal was sought in these surface workings, because ores of copper, cobalt, lead, iron, and manganese are associated together in that spot. If they were in search of copper, the ore must either then have been richer than that which they left behind, or they must have been acquainted with some mode of reducing the small percentage of copper (which averages considerably less than 5 per cent.) from the matrix, of which we are ignorant. This is at present effected by a bath of hydrochloric acid. Possibly, like some of the joint-stock companies of the present day, they may have been seeking for copper without success; but in that case the large number of stone hammers is not explained. Had tools such as these been used for the extraction either of lead or of iron they would most probably have been discovered in the workings which have been carried on throughout Great Britain, certainly since the Roman occupation to the present day. And it is hard to believe that the miners of Alderley worked these metals in a ruder fashion than any others in this country, so far as the present evidence stands. Nor is it at all likely that the insignificant and obscure ores of lead and iron at Alderley would attract the notice of miners in ancient times, when both were obvious, and very rich in the adjacent districts of Lancashire and Derbyshire.

The only conclusion which I will venture to draw, is that these implements imply a ruder phase of the art of mining than has hitherto been known in the neighbourhood of Manchester—a phase which may point back to the bronze age, when the necessary copper was eagerly sought throughout the whole of Europe.

EXPLANATION OF PLATE I.

Stone tools from ancient mines at Alderley Edge, Cheshire; in the collection of Colonel Lane Fox.

Fig. 1. Stone hammer, with groove for withy running round the middle of the tool.

Fig. 2. Stone wedge, with flat head and groove for withy.

Fig. 3. Stone pick, with two grooves transverse to each other at the upper end.

Fig. 4. Head of a stone tool, probably a pick, with two grooves as in the last specimen, but more clearly defined.

DISCUSSION.

The PRESIDENT said that on hearing from Mr. Boyd Dawkins of his discovery, he had written at once to Lord Stanley of Alderley, who had kindly directed that the works in that part should be

stopped until Mr. Dawkins' return from abroad. Mr. Dawkins had, therefore, had the whole of the investigation entirely in his own hands. And it would be well if all similar discoveries were in equally good hands, whether in regard to the scientific competence of the discoverer, or the obliging care shown by the landlord to preserve the relics until they could be duly investigated on the spot. Unfortunately it does not appear that any evidence of value has turned up to fix the date of these ancient mines. The resemblance of these hammers to those found in ancient copper mines elsewhere is worthy of the attention of anthropologists.

Dr. SIMMS exhibited and described five Lapp skulls, and made some remarks on the physical characters of the Lapps.

During his visit to Lapland, in the summer of 1874, he took measurements of a number of individuals. The physique of the Laplander is characterised by a relatively large head, bold forehead, small eyes, broad chest, long, powerful arms, and short, feeble legs. Dr. Simms maintained that the disproportionate length of arm was not to be regarded as a racial characteristic, but rather as the natural consequence of the Laplander's mode of life. The Lapps are expert oarsmen, spending much of their time in summer in fishing, and in winter they are much in their sledges drawn by reindeer. Dr. Simms observed that these occupations tended to develop the arms, especially during the years of growth, whilst the comparative disuse of the legs might account for their smallness and feebleness. He concluded, from his measurements, that those Lapps who follow boating have relatively longer arms than those who from early life have followed other occupations.

Mr. Brabrook read the following Paper for the Author:—

THE BASQUE and the KELT: an Examination of Mr. W. Boyd Dawkins' paper, "The Northern Range of the Basques," in the Fortnightly Review, September, 1874. By Rev. WENTWORTH WEBSTER, M.A.

"THE danger of all scientific work at present—not only among Oriental scholars, but, as far as I can see, everywhere—is the tendency to extreme specialisation." The truth of this remark of Max Müller, at the recent Congress of Orientalists, is perhaps nowhere more evident than in the present state of what is called the "Basque Problem." The problem is an exceedingly complex one, and is one which can be fully resolved by no one line of scientific inquiry; yet at present it seems as if almost every student of any one line persistently closed his eyes and ears to what is being done in other lines by other investigators.

Hence we have papers, on the one hand, like that of Mr. Boyd Dawkins, "On the Northern Range of the Basques," in the *Fortnightly Review* for September, 1874; and, on the other hand, like that of M. Van Eys, "La Langue Iberienne et la Langue Basque," in the *Revue de Linguistique*, Juillet, 1874. Mr. Boyd Dawkins, taking his supposed facts from, and founding his theory on, anthropology alone, arrives at the conclusion that Kabyles, Berbers, Iberians, Basques, Black Kelts, Bretons, Welsh, and Irish, are all the same race, with Ligurians and others as cognate races. M. Van Eys, keeping his eyes steadily fixed on Basque grammar and philology alone, arrives at the opposite conclusion, viz. that the Basques are not even Iberians, and altogether denies the conclusions of Humboldt and others, as to the presence of Basque names in parts of Spain and France beyond the limits in which the Basques are actually found. So the question stands between pure anthropologists and pure philologists. Meanwhile, all other branches of the question are almost wholly neglected—historical and archaeological researches, folk-lore, peculiarities of temperament, intellectual or moral, literature, drama, manners, and, strangest of all, even the physical characteristics of the present Basques—all the "differentiæ" which distinguish them from the surrounding peoples, and without the consideration of which the problem cannot be satisfactorily solved,—all these are utterly neglected. It was one excellence—and, we think, no slight one, whatever his other faults may be, and we are far from subscribing to all his conclusions—of M. Bladés's "Etudes sur l'origine des Basques" (Paris, 1869), that he endeavoured to give therein a "conspectus" of the whole field of inquiry, and to state the whole of the evidence; but since that time nothing at all similar has been attempted. Nay, we know but of one other student—M. d'Abbadie, de l'Institut—whose interest embraces the whole field of inquiry; who collects and co-ordinates facts in all branches alike, whether in philology, anthropology, archaeology, history, or folk-lore, and who notes with equal zeal all that may throw light on the mental and physical peculiarities of the present Basques.

Our attempt in this paper will be to show how incomplete and inconclusive (as appears to us) is the evidence of anthropology alone, and especially to examine the arguments of Mr. Boyd Dawkins in his paper in the *Fortnightly Review* of September last.

Before entering on this, however, it may save time if we state the outlines of what we consider has been proved about the Basques in other studies than that of anthropology. First, we consider that philology has demonstrated that the Basque

language (Eskuara) is agglutinative, or Turanian, taking that word in its widest acceptation, and that consequently it has no relation, whether of descent or parentage, to any Aryan or Semitic tongue. Secondly, we believe that Humboldt's conclusion is correct as to the existence of Basque names in the classical itineraries and geographies of Spain. Thirdly, that although the question of the identity of Basque and Iberian cannot be considered to be perfectly demonstrated so long as the so-called Kelt-Iberian numismatic legends and inscriptions are undeciphered, still the degree of probability is very high. To borrow the opening phrase of Mr. Boyd Dawkins' paper, we should consider non-Aryan, Basque, and Iberian to be nearly parallel to Aryan, Greek, and Pelasgian. The arguments as to the identity of the Hellenic race with the Pelasgic race we imagine to be pretty much in the same state as that of the Basque with the Iberian.

We find it sometimes difficult to state with precision the arguments of Mr. Boyd Dawkins; for one of the great disadvantages of the extreme specialisation of the sciences noted above is, that adepts in one branch of science are constantly at sea when handling the terminology of another, and from Mr. Boyd Dawkins' loose use of historical terms, we are occasionally left quite in the dark as to what his meaning may really be. We beg him to believe that we do not wilfully mistake him; *e.g.* on his first page, speaking of the population of Spain in the time of Thucydides, he writes, "The Vascones then, as now, held the Basque provinces, and probably occupied the adjacent parts of Southern France." If by Vascones he means the Basques in general, then his statement of their range in the time of Thucydides might be extended with probability far beyond the parts of France adjacent to the Spanish Basque provinces. If by the Vascones he means the Iberian tribe of that name, then there is simply no evidence that they ever were in France at all. In another place he speaks of a "Basque inhabitant of Bagnères de Bigorre." Here, again, we are completely puzzled; it is exactly like speaking of a Welsh inhabitant of Wiltshire. The average Béarnais-Gascon of Bagnères de Bigorre is no more like the average Basque than the average Welshman is like the average Englishman.* We cannot decide whether Mr. Boyd Dawkins supposes Bagnères de Bigorre to be actually within the limits of the present Basque country, or whether he refers to a probable prehistoric location of the Basques in that district. If the former, it is a blunder scarcely

* The writer lived four years at Bagnères de Bigorre before coming to the Pays Basque.

excusable in a paper professing scientific accuracy. If the latter, to compare a "Welshman who is *now* to be seen walking about the streets of St. Asaph" with a Basque who disappeared from the earth in prehistoric times, is at least a curious expression, especially when the argument is brought forward to confirm the truth of an assertion of Tacitus. We may as well state our opinion on this much disputed passage of Tacitus* before going further. The restriction of the term *Hiberos* or *Iberos* to the Basques in this passage seems to us an instance of a not uncommon mistake of scientific men when dealing with ancient authorities, viz. that of importing into rhetorical classical writers their own strict accuracy in the use of scientific terms. *Iberi* or *Hiberi* was the received poetical and rhetorical term for Spaniards generally in Tacitus' day,† and he doubtless only meant to draw attention to the likeness between the Spaniards generally and portions of the Keltic inhabitants of Britain—a likeness which is equally evident in the present day, but of Spaniards and not of Basques. Only the other day we heard repeated, by the military correspondent of an English paper, a remark which we have frequently heard before, viz. how like the men of the Spanish regiments, especially the Castilian (from the country of the old Kelt-Iberians), are to the Irish, and especially to the Connemara men, with the same projecting jaw and style of march. "I could almost have sworn they were Irish regiments," said my informant. This Spanish likeness is doubtless what Tacitus meant. But the Basques are very different.‡ No mediæval historian—or, indeed, scarcely any historian till quite recently—would distinguish Basques from Spaniards, when speaking of Spain; the differ-

* Tacitus, *Agricola*, xi. "Namque rutile Caledoniam habitantium comor, magni artus, Germanicam originem adseverant. Silurum colorati vultus, et torti plerumque crines, et posita contra Hispania, Iberos veteres trajecisse, easque sedes occupasse fidem faciunt: proximi Gallis, et similes sunt."

† Cf. Jornandes "de Getarum sive Gothorum origine et rebus gestis," cap. ii., where he seems to paraphrase this passage of Tacitus. "Sylorum (Silures) colorati vultus, torto plerique crine, et nigro nascuntur, Caledoniam vero incolentibus, rutile comor, corpora magna sed fluida; qui Gallis sive Hispanis à quibusque attenduntur assimiles. Unde conjectavere nonnulli, quod ea ex his accolæ continuo vocatos acceperit; inculti aque omnes populi, reges que populorum." As to Pliny's "Aquitania Armorica ante dicta," compare the introduction to Long's edition of "Cæsar de Bello Gallico," p. 26, and the notes on vii. 75, and viii. 31. The name simply means maritime, or, rather, "pæroceanitic."

‡ "The population of this neighbourhood (Tolosa) has nothing Spanish in its physiognomy and expression; indeed, I could pick out of a Dorsetshire village many more effective representatives of the Don than we saw anywhere between Iron and Vittoria. Guipuscoa is one of the three Basque provinces, and its inhabitants still exhibit that comparative fairness of complexion which they have inherited from some sea-king, who once upon a time made a descent, and then a permanent settlement, on these coasts."—"An Autumn Tour in Spain in 1859," by Rev. R. Roberts (p. 49). London, 1860.

ence of race and language would most probably be unknown, except to professed geographers.

The conclusion of Mr. Boyd Dawkins which we especially dispute is the following:—"At all events, the former presence of an Iberian race in Armorica is demonstrated by Dr. Broca's map of the stature and complexion of the people of France."

With reference to this map, and the conclusions drawn from it, we must first remind our readers that the Basques at present inhabit only the greater portions of two "arrondissements" in the Department of the Basses Pyrénées; consequently, in considering France by departments, the average of any peculiarity they may possess in stature, colour of hair, eyes, and complexion, must be greatly modified by taking the average of the whole department together.* Suppose, for instance, that in two parishes of an English county fair-haired people lived, and black-haired in all the other parishes of the same county, and far outnumbering them; it is evident that in distributing all the counties of England into black, brown, or fair, these fair-haired people might be utterly sunk in the total, and be spoken of as brown or black-haired, however fair this minority might be. Something similar to this is the case with the two Basque "arrondissements," when France is considered in departments only.

The conclusions of Mr. Boyd Dawkins, and of all those who derive the Black Kelts from the Basques, depend on two supposed facts:—(1) the form of the Basque skull, both ancient and modern; and (2) the stature, complexion, colour of eyes, and hair of the living Basques. For this argument the typical Basque skull is assumed to be dolichocephalous; but it is dolichocephalous in a peculiar way—the posterior portion is elongated, and not the anterior. And there is also another peculiarity: long as the posterior portion is, there is no occipital protuberance, but an unusually strong posterior base of the skull; and this form of the skull doubtless occasions the remarkably upright carriage of the Basque of the present day. The facial angle is good, and the jaw peculiarly orthognathous, often opisthognathous.† Secondly, the Basques are assumed to be

* The Basques are about 120,000, certainly not more, in a population of from 430,000 to 450,000 in the Department of the Basses Pyrénées.

† "J'ai à peine besoin de rappeler que les crânes de Z— (Zarauz, the most unmixed, as we shall see below) sont dolichocéphales d'une tout autre manière que ceux du nord de la France; que leur dolichocephalie est *occipitale*; qu'elle coïncide avec une face petite, très orthognathe, souvent même opisthognathe, avec une réduction remarquable de la protuberance occipitale, autant de caractères qui distinguent les Basques Espagnols de tous les groupes connus de dolichocephales indo-Européens."—"Mémoire sur les crânes Basques," par M. Paul Broca. Paris, 1868 (pp. 52, 53). [The italics are M. Broca's.]

low in stature, of dark complexion, hair, and eyes. We will examine these two points in order; but we must first remark, that in any comparison of Kelts with Basques we should have expected the more permanent points of likeness, and those less liable to change, would have been chosen to constitute the proof of identity; but the contrary is the case. It is not asserted that the skull of the dark Kelts of the present day at all resembles the skull of either past or present Basques, the one being eminently orthognathous, and with a high facial angle, the other with an inferior facial angle, and prognathic. It is on the colour of the hair, eyes, and complexion, and lowness of stature, that the stress of the comparison rests. Yet these would surely change more quickly than the form of the skull. Besides, the comparison in prehistoric times depends entirely on the form of the skull, and we fail to see how the colour of the hair, eyes, and complexion can be deduced therefrom.

Let us now consider the localities whence the typical Basque skulls were taken. They are—fifty-eight from St. Jean de Luz, seventy-eight from Zaraus, and six from Bilbao. Those from St. Jean de Luz are said to have been collected in the reign of François I., 1532. We first ask, what certainty or high degree of probability is there that these are Basque skulls at all? At the present day, after a six years' residence in St. Jean de Luz, and a pretty close knowledge of its inhabitants, we are confident that (excepting domestic servants from the country) there are not a dozen even relatively pure Basque families in the place. Certainly the population is a most mixed one. To search for a pure Basque type there is something like searching for a pure English type at Liverpool or Wapping. And the history and archives of St. Jean de Luz show that the population was even more mixed in the sixteenth century than at present. This is allowed by Dr. Broca, who finds these fifty-eight skulls so far from being frankly dolichocephalous, that they exhibit two distinct types, of which he says (p. 21), "*Ici (à St. Jean de Luz) les brachycéphales prédominent manifestement.*" Bilbao, also, was formerly one of the naval arsenals of Spain, and would thus be liable to a mixture of population. Zaraus is also a small seaport on the coast of Guipuscoa, but, as we should have expected, the skulls thence show less admixture than the others; yet even there the dolichocephalous are only 48·33 per cent., while the mésaticéphalous and the brachycephalous together are 51·67 per cent. But none of these are fitting spots whence to select typical skulls. In a sailor race like the Basque we should have thought the seacoast especially to be avoided, and next to that the neighbourhood of the great roads, whether ancient or modern; and also

the extreme Franco-Spanish frontier on both sides, which has been a place of refuge for generations.* Only in localities apart from these is there the least chance in the present day of judging what the Basque race really was.

At the same time that M. Broca procured these skulls, he requested M. Argeliez, a medical man of St. Jean de Luz, and a native of the neighbourhood, to make observations on the colour of the hair and eyes of the Basques. This M. Argeliez did very carefully, not making his observations on the first comers, but only on those families whom by personal inquiry he ascertained to have been pure Basques for at least two or three generations. The result, given at pp. 64, 65 of M. Broca's pamphlet, is—that of forty-seven Basques examined, twenty-five had brown eyes (ten of which were very light brown), and twenty-two blue, green, or grey eyes (fourteen blue, seven green, one grey), and this in the part of the Pays Basque where the population is the darkest. Yet this is the race set down dogmatically as a dark race. It almost seems as if there were a fashion in scientific observation, as in other things. The observers of the last generation were driven to invent theories to account for the fairness of the Basques; the anthropologists of the present day declare them to be dark. Arthur Young, Sir W. Napier, and Ford (and I know not where we can find three better observers), all declare them to be fair. Ford, speaking only of the Spanish Basques, who are undoubtedly somewhat darker than their kinsmen in France, says (Murray's Handbook, vol. ii., p. 873): "The Basques have been less successful in resisting invasions by sea, for they were partly overcome by a fair-haired Northman, named Zuria, an adventurer either from Norway or Scotland; and to this foreign admixture *their fair complexions* and immemorial representative government have been traced." So in France, theories of admixture with Visigoths, Franks, Cagots, English, and Northern pilgrims have been formed, to account for the same fact. It was only from hasty generalisation from the observations of MM. Quatrefages and Broca on the sea-coast, where the population is decidedly more mixed and darker than in the interior, that the theory arose that the present Basques are a dark people. Yet even M. Quatrefages, "*reconnu plus tard qu'il y avait aussi beaucoup de blonds parmi les Euskariens.*" "*J'en ai vu, dit-il,*

* The need of caution on the frontier may be shown by a personal anecdote. The first time we visited Bariatou, the last French village on the frontier, we were struck with the appearance of the people; all our former observations were reversed. But the first answer to our inquiries solved the difficulty. "Out of five hundred inhabitants of the 'commune,' at least four hundred are Spaniards" (i.e. Spaniards, not Basques; Spaniards and Spanish Basques are never confounded on the frontier). The place had been a refuge for generations.

un grand nombre dans les environs de Saint Sebastien, j'avais cru d'abord que la couleur claire de leur chevelure etait le résultat de quelque croisement; mais j'ai pu m'assurer que ces individus blonds présentaient, sous tous les autres rapports, les caractères de la race basque parfaitement pure. J'ai eu l'occasion de causer sur ce sujet avec M. d'Abbadie, il pense comme moi, qu'il y a de vrais Basques blonds." * Our own observations, carried on in almost every village of the French Pays Basque, and extending over some years, fully confirm this. One meets plenty of dark faces in the Pays Basque, and everywhere, perhaps, the darker Basques are in the majority; yet wherever there is an unusual preponderance of these, a mixture may be suspected. We admit the two types, fair and dark (and a third distinct from either), as readily as M. Broca admits the two types of brachy- and dolichocephalous skulls; only we maintain that the fair type—especially with blue or grey, or very light brown, eyes, with somewhat darkish hair, is the distinctive Basque type among the surrounding peoples, and that it will be found more numerous in proportion to the distance from the neighbourhood of the sea and the great roads, where the chances of admixture are the greatest.

Unfortunately, we have not seen M. Broca's map, and must therefore take an account of it from the pages of Mr. Boyd Dawkins. In it the departments are coloured "blancs, gris, et noirs," according to the colour of the hair, eyes and complexion, and stature, which range from highest to lowest according as the complexion, &c., varies from fair to dark. The populations of dark complexion and low stature in the departments "noirs" are supposed to be descended from the Basques. Consequently, if this theory be correct, we should expect to find the blackest departments to be those bordering on the Pays Basque, and that the department which contains the present Basques would be the darkest of all. But the facts do not seem to tally with this. The blackest departments seem to be those between the Loire and the Garonne; those to the south of the latter river are with one exception "gris." "Out of the eight departments into which it (Cæsar's Aquitania) is now divided, only one (Landes) presents the Basque characters." The loss of Basque characteristics where they should most abound is accounted for

* "Souvenirs d'un Naturaliste," quoted by M. Bladé, "Etudes sur l'Origine des Basques" (p. 217), where are numerous other testimonies to the same effect. M. Bladé's own summary, in an additional note at the end of the volume (p. 537), is, "J'ai prouvé qu'il y avait des Euskarieus bruns, blonds ou châains, et je suis à même d'affirmer qu'il existe chez ce peuple beaucoup d'hommes aux cheveux lisses et souples, et non pas toujours un peu raides et cassants." This, which our own observation confirms, disposes of Tacitus' "torti plerumque crines" being applied to the Basques.

“by the open and defenceless state of the country” (!). Their preservation in the Landes is accounted for “by the vast stretches of sand, and the gloomy pine forests, which have acted as barriers against invasion.” The gloomy pine forests (*Pinus maritimus*) were all planted almost within the memory of the present generation !* Again, “the six ‘départements gris’ south of the Garonne mark the settlements of the fair-haired Visigoths, Franks, and English, who have been masters of that country from the year 409 to the present day.” This curious piece of history Mr. Boyd Dawkins seems to have extracted from M. Broca’s pamphlet. There was, indeed, an English occupation of Guienne—that is, English kings and princes ruled as Gascon sovereigns over a Gascon population, and the Black Prince held a semi-English court at Bordeaux. English, Gascon, and Basque knights together commanded mixed armies, and occasionally English knights commanded Gascon garrisons ; but in both cases the majority of the privates would be natives of the country. Of Visigoths and Franks—especially of the latter, who were detested by the Basques, and southern populations generally—there was probably less mixture than in any other part of France. As to stature, which is said to vary with the complexion, according to the table quoted by Mr. Boyd Dawkins, there are only about half as many military exemptions on account of low stature in the departments “gris” as in the departments “noirs.” The number of exemptions per 1,000 is—

| | |
|--------------------------|----------------|
| Départements noirs . . . | 75·47 à 147·85 |
| “ gris . . . | 54·77 à 74·40 |
| “ blancs . . . | 24·39 à 54·11 |

The only “département noir” out of the eight in Cæsar’s Aquitaine is that of the Landes. But any one who may have seen the Landes before the railway traversed it will at once admit that that department should be put aside in any comparison with the other seven departments. The whole case is exceptional. The following is a description of the population given in “*La Patrie*,” an encyclopædia of France, published at Paris, 1847. The article ‘*Géographie Médicale de la France*’ is written by Dr. A. de Pileur—“Population des Landes abâtardie ; les races d’animaux s’abâtardissent aussi dans les Landes. Misère, mauvaise nourriture ; millet, maïs mal cuits, mal préparés sans levain ; poisson salé fermenté, avarié, à peine cuit.

* That is, towards the close of the last (1787) and the beginning of the present century. During the Confederate Civil War, when the resin suddenly became most valuable, there was a curious law suit, whether the planters (i.e. the Government) or the proprietors of the land were the owners of the trees.

Malpropreté extrême. Hommes petits, maigres; teint brun, jaunâtre; air maladif. Enfants chétifs, se développant tout-à-coup de 16 à 20 ans; vieux à 40, dépassant rarement 50 ans." (*The average of life in the Basses Pyrénées is 45 years.*) "Fièvre intermittente endémique; type tierce le plus fréquent; rate hypertrophiée à un degré monstrueux, pesant quelquefois 15 kilog., sans dégénérescence," &c. All this results from malaria, and from drinking the water of the marshes, which cover almost the whole department. Surely no fair comparison can be made between a population under these abnormal conditions and others under normal and healthy ones. Thus, then, we have the fact that the departments from which, according to theory, the Basques must have last retired, and the department, part of which they actually inhabit, classed, not among the "noirs," but among the "départements gris." What, then, becomes of the theory that a dark complexion, with its accompanying lowness of stature, is derived from the Basques alone?

Next let us examine whether the Basques are lower in stature and darker than the rest of the population of their own department, the Basses Pyrénées. First we observe that the northern frontier of this department is conterminous with that of the Landes, and that the geological formation of this department extends for a few miles into the Basses Pyrénées; consequently, we should be prepared to find the population of that part of the department as dark as that of the Landes, and, therefore, to bring the whole department under the range of "gris," the southern portion must be more than usually fair. As to one of the three divisions—Labourd, Basse Navarre, and La Soule—into which the Pays Basque is divided, the testimony is unanimous. Every observer allows that the Souletins are fair and tall. A trustworthy informant assures us that at a *pastorale* played at Licq all the actors were up to, or approaching six feet, and these would all belong to the village or "commune" alone. This district, La Soule, is the one most remote from the sea, and from the great roads. In the other two districts, though the difference in height is not so marked in them, there can be no doubt that both Labourdin and Bas Navarrais are somewhat taller both than the average Frenchman and than the inhabitants of the adjacent plains.* Nowhere could this be better seen than at the assembling of the Mables at Bayonne,

* Cf. Michelet "Histoire de France," tom. ii. p. 47, Paris, 1852. Speaking of the fair of Tarbes, and of the different races which meet there: "Mais vous distingueres bien vite le Béarnais et le Basque, le joli petit homme sémillant de la plaine, qui a la langue si prompte, la main aussi, et le fils de la montagne qui la mesure rapidement de ses grandes jambes, agriculteur habile, et fier de sa maison dont il porte le nom."

in 1870-71, when each village brought its own contingent. As the Basques came in, one could not help remarking that no general need wish for finer material. The same remark is made by all who have seen the Spanish Basque regiments in the present Carlist war, especially by a military correspondent of the *Times* of Sept. 6, 1874, who asserts that our own recruits contrast most unfavourably with them. Yet this is the population from which the inhabitants of the Landes and the men of western and central France are said to derive their shortness of stature!

Next, are Bretons and Basques alike? Would there really be scarcely any difference discernible between them if a Welshman were placed among the Basques? Of course the races are not so distinct as that individuals may not be found with a very striking resemblance, the same as may be found in individuals, between Welsh and English, French or German, Spanish or Italian, or Hungarian, in fact, between individuals of any one European nation with individuals of any other. But is the type of the population alike? We have been fortunate in making the acquaintance of Messrs. Letrone, father and son, both of whom had been long engaged in archæological investigations in Brittany, before coming to reside in the Pays Basque. The son, moreover, is an artist of repute, and a most careful draughtsman. Both these gentlemen declare that they cannot see the slightest resemblance between the Breton and the Basque type. At my request, M. Letrone fils made, with the "camera lucida," in the neighbourhood of Itzatzou, portraits of Basques whom he considered to be typical representatives of the population. These individuals had all blue or grey eyes and light hair. Looking over the sketch-books of another artist, M. H. de Meurville, who has resided both among the French and Spanish Basques, which were filled with portraits of Spaniards, Italians, and French, in no particular order, I found no difficulty in distinguishing the Basques, and these again had almost all fair hair and eyes. The same artist, when requested to select a model for an amateur, without reference to beauty, but to type only, chose a fair-haired woman. Neither of these artists had any pet scientific theory to support. How, then, has the confusion arisen? From several causes. 1. There is undoubtedly more than one type among the present Basques; but even the dark Basques are not so dark as their Spanish neighbours. 2. Scientific observations have been made only along or near the sea-coast, where the population is both more mixed and darker than in the interior. 3. A careless observer is apt to mistake a sunburnt complexion for a really dark one, and does not remark the colour of the eyes, which often among

the Basques contrasts with the darker hair and sunburnt face.* 4. It is difficult for a stranger at first sight to know whether the individual he is looking at is a Basque, a Spaniard, or a Gascon. The number of foreigners in the Pays Basque is very great. In the towns, almost the only pure Basques to be seen will be the servants from the country, and the country people on market-days. Just now the moment is peculiarly unfavourable for making such observations. The frontier villages and the whole country are full of refugee Spaniards, and of the men at work on the high roads and in the towns the majority would be Spaniards or Gascons. It is only among the agricultural class, away from the great roads, and on the mountains, that the observer has a chance at first of studying the purer Basques; but when he has thus learned the type he will have no difficulty in distinguishing them from others in the towns, and at the weekly or fortnightly markets.†

It is not a bad test of a theory to see whether [it needs any extreme suppositions for its support. Among the partisans of the theory of the descent of the Black Kelts from the Basques, we notice a strange reluctance to admit the possibility of the existence of a natural type of men with brown hair and eyes. These are always regarded as of necessity the offspring of a mixture of fair- and black-haired races. Yet the necessity is by no means obvious. Is it not something like saying that all bay horses *must* be the offspring of a black and a white sire and dam? Again, in comparing the Kelt-Iberian with the Black Kelt, the Castilian Spaniard with the dark Irishman or Welshman, it seems to us more scientific to admit that their likeness arises from the known quality which they have in common as Kelts, than to invoke the less known quality of the one to compare with the wholly unknown quality of the other. Again, an undue stress is laid on the comparative height of the ancient Gaul with that of the Frenchman of to-day, and the authority

* A capital instance of what we mean is given in the following description of the famous Basque cura, Santa Cruz:—"By the way, none of the portraits published of Santa Cruz have the slightest likeness to him. He is everywhere represented as a very dark man, while in reality he is quite fair; certainly not fair in the sense of Scotch or German fairness, but what is called 'blond' in France, which is equally as far from dark brown or black as from 'blond cendré.' His blue eyes are rather deeply seated."—"Spain and the Spaniards," by N. Thiéblin (Azamat Batuk), vol. i. p. 257. London, 1874.

† That a Basque can be distinguished from a Gascon the following anecdote shows:—"Nous nous trouvions sur le seuil de l'Hôtel des Touristes, à Laruns, dans la vallée d'Ossau, quand vint à passer un jeune homme aux traits nobles et réguliers et portant avec grâce ses vêtements de simple villageois. C'est un Basque, fit le maître d'hôtel, qui s'était aperçu de l'impression produite sur nous par cet étranger. A quoi l'avez vous connu lui dîmes-nous. Rien qu'à le voir, répliqua-t-il." "Voyage de Bayonne aux Eaux Bonnes, p. 57; par F. Samazeuilh. Bayonne, 1858.

of a writer like Levy is invoked against the contemporary authority of a man like Cæsar, writing of the people before his eyes. It is evident* that the relative difference in the height of the Kelt of midland France and the German was at least as great in Cæsar's day as at present.

Another collateral argument brings great conviction to our mind. Whether we follow the march of Hannibal from Spain to the Rhone, or the campaign of Crassus into Aquitania,† we seem to pass, directly we get beyond the parallel of the Adour, into a different zone of civilisation, and into a distinctly different phase of religions. Although the Iberian race may have been since outstripped by the Keltic, it seems at that period to have been in possession of a distinctly higher civilisation. The Iberians and Kelt-Iberians were the most trustworthy and disciplined of Hannibal's troops, and under Sertorius proved themselves at least a match for the Roman legions. This the pure Kelts never did. The very tribe, the Vaccœi, from which the Basques probably derive their modern name, is pointed out by Diodorus Siculus as in his day the highest in civilisation of all the surrounding peoples.‡ It was probably owing to this higher civilisation that they did not disappear before the Kelts, but remained, or mingled with them, while the more uncivilised pre-Keltic peoples to the north have utterly disappeared. The scanty facts relating to religion point to a similar conclusion. From the Pyrénées to Brittany, from Basque to Kelt, we take a very wide step. The Keltic religion was so marked as to have attracted the notice of all classical authors; of either the Iberian or the Basque (whether they be separate or the same) not a trace remains. We know absolutely nothing of it. To judge from the few altars and inscriptions found in the Pays Basque, it would seem almost to have coalesced with the Roman. The same contrast is apparent in the reception of Christianity by the two races. The Kelts, whether in Asiatic Galatia, in France, in Spain, or in the British Isles, were among the most eager to receive Christianity. In the second century the martyrs of the Rhone Valley were celebrated throughout all the Churches. In the next century Christianity had penetrated through Gaul to Britain, and had subdued the whole of the Western Kelts. But to the close of the ninth century the Pays

* "Ex percussione nostrorum vocibusque Gallorum ac mercatorum qui ingenti magnitudinis corporibus Germanos, incredibile virtute atque exercitatione in armis esse predicabant." "Cæsar de Bell. Gall." Lib. i. 39. The same inference may be drawn from the language of Tacitus and Jornandes, quoted above.

† "Cæsar de Bello Gall." end of Lib. iii.

‡ "Χαριστάτοιός τε τῶν ἀλλοειδῶν ἐθνῶν ἀστυς ἐστὶ τὸ τῶν Οὐσκαίων ὄρεμα-ζομένης σίστημα," Diodorus Siculus V., xxxiv. 3. All the classical authors speak with astonishment at the skill of the Iberians in mining in the Pyrénées.

Basque was to Gaul what Western Africa of the present day is to our missionaries—men went there to receive martyrdom.* We hear of martyrdom at Bayonne as late, perhaps, as the tenth century. Slowly Christianity won its way along the great Roman road to Pampeluna, and up the valley of the Nive to the Bastan. But La Soule and the sea-coast, to judge from the narrative of a bishop of Bayonne in 1120, were not fully converted until the twelfth century; while around them their neighbours—the Gauls to the north and east, and the Spaniards to the south—had for centuries past been giving most distinguished theologians to the Church. The same tenacity in clinging to an old faith appears in their resistance to Protestantism under Jeanne d'Albert. The founders of Jesuitism, Loyola Xavier, and others, were Basques, and Basques are still among the best and most fervent missionaries of the Roman Catholic Church. Loyola, even in physiognomy and physique, was a typical Basque, and preserved his Basque habits till his death. These facts, though by themselves utterly inconclusive, still do not point to identity of race with the Kelt, and it is incumbent on the upholders of the theory of a more northern limit of the Basque race to give some explanation of them, and also of the kindred fact that all trace of any former existence of the Escuara language ceases at the same northern limit, viz. somewhere about or beyond the parallel of the Adour.

To resume, we do not deny the possibility of Iberian trading establishments on the south and south-western coasts of the British Isles. Phœnician and Carthaginian ships navigating the Atlantic were probably in part manned by Iberian sailors. But this is a very different thing to a pre-Keltic Basque population, or to anything which can give a just title to the phrase, "our Iberian forefathers." We do not dispute the existence of a pre-Keltic, perhaps a non-Aryan, race in Gaul and the British Isles, but we contend that no sufficient evidence has yet been brought forward to prove that this race was the Basque. It may have been a cognate race, using the word loosely, as we may say that Teutonic, Keltic, Hellenic, and Latin races are cognate as included under the European branch of the Aryan race.

In the same wide sense, Basque or Iberian, Ligurian, Etruscan, and this unknown pre-Keltic race, may have been cognate races; but this is not proved, and the evidence utterly fails to

* Anno Christi, 684. "Tandem inter cetera genuinam B. Rictidis agrosus est patriam, scilicet Vasconiam, ut illic et plures, et hanc sibi coelitus infuso, quo ardebat, irradiaret lumine stellam, reputans etiam ob illius gentis servitiam se inibi posse martyrii palmam adipisci." "Vita S. Amandi" Acta Sanctorum, Tom. vi. 823, also the lives of 88. Adalbaldis, Rictidis, and Leo of Bayonne.

establish the existence of the Escualdun-, and Escuara-speaking race proper, far beyond the parallel of the Adour to the north, and Spain and its dependencies to the south. That the Basques were in Europe during the stone age, since several of the Basque names for cutting tools seem to be derived from a root signifying rock or stone, is also possible. The skulls found in caves in Bœtica and Spain generally, in connection with stone implements, may also possibly be Basque; but this is a district where the Kelts never drove out the Iberians. There is no evidence to connect the Basques with the megalithic monuments found in Keltic countries, and the absence of which is remarkable in the lands occupied by the purer Basques. We believe we have shown that the derivation of the dark and short men of western and central France from the Basques, who are fairer and taller, rests on hasty generalisation, and is not borne out even by statistics drawn from M. Broca's map. We have brought evidence to show that the Basques are on the whole fairer, and not darker, than the peoples around them, and it must be remembered that *all* these surrounding peoples are more or less mingled with Keltic blood. The only fairer race in contact with them is that of the Cagots, who were few in numbers, lived in isolation, never intermarried with the Basques, and of whose origin nothing certain is known. It is not asserted that the skull of the dark Kelt approximates nearer to that of the Basque than does the skull of other Kelts, but the contrary, as a mere prognathous opposed to a peculiarly orthognathous skull; nor do we see how the colour of the hair, eyes, and complexion, nor even with certainty the stature (for the relative height with regard to the size of the skull may differ in races, as it certainly does in individuals) can be deduced from the ancient skulls. We will close by quoting some words of M. Broca which his disciples seem too often to forget: "Soit que l'on considère comme primitif le type brachycéphale, aujourd'hui prédominant dans le Labourd, ou le type dolichocéphale—les notions anthropologiques que nous possédons sur la crâniologie basque sont jusqu'ici trop restreintes et ont été recueillies dans des localités trop peu nombreuses que les conséquences qui paraissent en découler puissent être considérées comme définitives" (pp. 54, 55). And, in conclusion, "Mais, je le répète, les faits qui ont servi de base à mon travail sont encore trop circonscrits pour se prêter à des conclusions positives, et le but que je me propose surtout en émettant ici cette conjecture est moins d'ébaucher une théorie que de provoquer de nouvelles recherches dans les parties du pays basque que j'ai explorées, et surtout dans celles qui n'ont pas été visitées encore par les Anthropologistes." These further researches have not

been made. The present writer has in the course of several years passed through most of the villages of the French Pays Basque—many of them, and those the most secluded, several times. He has handled, too, a considerable number of skulls in the Pays Basque,* and though making no pretence to scientific exactitude, has learnt to distinguish carefully the Basques from the Gascons, French, and Spaniards, who form so considerable a portion of the population of even the most remote towns of the Pays Basque. The evidence from anthropology alone does not seem sufficient to support the theory here combated, while the whole evidence of philology, history, civilisation, religion, and the physical characteristics of the present Basques, are against it.

DISCUSSION.

Professor BOYD DAWKINS stated, in reply, that he had listened with considerable astonishment and disappointment to the pungent remarks on the views of the northern range of the Iberian race held by Thurnam, Huxley, Draper, and himself, and published in outline in the *Fortnightly Review* (September, 1874, p. 320). He was astonished that the charge of "specialisation" should be urged against an essay in which the evidence of history, of the physical characters of the peoples in the area under dispute, and of researches into caves and tombs, was brought to bear on the general question; and he was disappointed that Mr. Webster had not added a single new fact to those which have been published several years ago by Broca, Thurnam, and Huxley,† in dealing with this most important and difficult problem.

Mr. Webster's criticism is based altogether on a misconception of the essay which he attacks. Had he paid attention to the first line in it he would have seen that the terms "Basque or Iberian" are applied to the non-Aryan race, proved by the historian to have possessed a large part of south-western Europe, and which probably spoke a language allied to the Basque or Euskarian. His remarks are directed against the view that the ancestors of the present speakers of the Basque language ever ranged far to the north, a view which is *not advanced* in the essay under discussion. They, therefore, do not apply to the subject-matter of that essay. Nay, further, when Mr. Webster states that in the Pays Basque, "everywhere, perhaps, the darker Basques are in the majority," that the Basque is probably a fragment of the Iberian race, and that an

* We make no use of our observations on these skulls (over one hundred), because, although many must have been Basque, and many were of the peculiar type, with the strong posterior base, narrow, well-formed forehead, and ortho- or opisthognathous jaw, there was no external evidence whatever to prove that any given skull was Basque.

† Broca, "Bull. Soc. Anthropol." ss. 1, i. p. 470—1, ii. p. 10; Thurnam, "Anthropological Memoirs," i. pp. 120, 459, *et seq.*, iii. p. 41; Huxley, in Laing and Huxley, "Prehistoric Remains of Caithness;" and "Critiques and Addresses," p. 167.

Iberian or cognate race may have spread northwards over Europe in the neolithic age, he is holding opinions identical with my own. It is unnecessary to examine the points raised as to the ethnology of the present inhabitants of the Pays Basque, as they have been carefully and critically treated by Broca, Thurnam, and others (see reference above), with the net result of establishing the fact that the speakers of Basque are divisible into a dark and a fair stock, and that the latter is probably of non-Iberien derivation.

The dark Bretons seem to me, as well as to Professor Huxley, to belong to the same stock as the Iberian of the Aquitania of Augustus, with whom they are conterminous, as may be seen from a comparison of my map* with that of Dr. Broca.†

With regard to the curious piece of history, that the fair-haired Visigoths, Franks, and English had been masters of Aquitaine from A.D. 409, I have to thank Mr. Webster for a correction. The date 409 is a misprint for 419. If he refers to Gibbons' "Decline and Fall" (chapter xxxi.) he will find evidence not merely of a Gothic invasion, but of a Gothic *settlement*; and, further, if he will compare Broca's map with the records of the invasion of Gaul by various hordes, he will see that the physique of the present inhabitants depends to a large degree on that of the invaders; in other words, that the present ethnology of France may be satisfactorily explained by an appeal to history.

To pass over all minor points, the question before us is whether there be sufficient evidence to prove the former range of the Iberian peoples as far north as Britain, and as far to the east as Belgium. The convergent testimony of history, ethnology, and of investigation into caves and tombs, is most decidedly in favour of such a view, in my opinion, and in that of many good judges. The objection to this view urged by Mr. Webster, that the Black Kelts‡ are not long-headed, is one of the more serious errors in his criticism; while that urged by the Saturday Reviewer,§ that they may be of Finnish stock, is negatived by the fact that the Finns are a tall, fair, broad-headed race. With regard to the latter, it is well to observe that the Finns *may* be represented among the fair Kelts, since both Thurnam and Huxley|| agree that there are no physical differences of importance to be noticed between them.

It remains now to examine the only remaining objection, which is based altogether on philological grounds, and which has found its most able advocate in the *Saturday Review*. "If," says the reviewer, confining his remarks to Britain, "the Silures and the small, swarthy Welsh of the present day are of Iberian stock, why are there no Iberian roots in Welsh? No one has shown that there is even an infusion of Basque in the Welsh language; no one has shown that there is any trace of Basque nomenclature in any

* "Cave-Hunting," p. 221.

† "Memoires d'Anthropologie," 1, i. p. 448, Carte 1.

‡ Laing and Huxley, *op. cit.* p. 127.

§ *Sat. Rev.*, 2nd Sept., 1874, 'Mr. Dawkins on the Basques.'

|| Laing and Huxley, *op. cit.* p. 116.

distinct part of Britain. A Keltic settlement in such an age among a Basque people must have led to the extermination or expulsion of the Basque inhabitants. That they should have turned into Kelts, without leaving any trace in the language, or even the nomenclature of the country, is a thing which, in our point of view, seems altogether unparalleled."

Now, to pass over the hypothesis that settlement of Keltic among Iberian tribes "must" either imply extermination or expulsion of the latter, which seems to me incapable of proof, it is assumed that there is no trace of Basque or cognate Basque speech in the Keltic tongues. Is this so? It would be presumption in me to attempt to give an answer to this most difficult question; the *onus probandi* rests not with me, but with the philologists. I would, however, ask whether they have proved that there are no traces of a non-Aryan tongue in the Keltic languages? For many years I have been attempting to obtain evidence on the point, without success, until my book was published in the autumn. It seemed to me that the Keltic languages had not been analysed by any competent authority, with a view to the discovery of non-Aryan traces, and I therefore did not discuss "the philological difficulties, which" the Saturday Reviewer (Nov. 14th, 1874) says, rightly, "I failed to appreciate." May I now ask the distinguished philologists at this meeting what philology has to say to this question?

I would also further ask, Is language a test of race? The Saturday Reviewer admits "that it is certain that many nations have changed their language without any change in themselves." And if this principle be admitted to be true, the assumed absence of Basque words in the Keltic tongues does not present any difficulty to the views held by Huxley, Thurnam, and myself. The question, in that case, narrows itself to the simple issue whether it be easier for the Ethiopian to change his skin and all his other physical characteristics, or to change his language. He would be an enthusiastic believer in the immutability of words who could maintain the latter alternative. I hold, therefore, that even if there be no traces of Basque in Welsh, that fact does not affect the further point as to whether the small, dark, swarthy Welshman is descended from that or an allied branch of the non-Aryan inhabitants of Europe. It seems to me that Mr. Webster has not contributed anything to the solution of the problem before us; a problem which is equally important to the ethnologist and the historian.

PRINCE L. LUCIEN BONAPARTE said: Mr. Webster's discourse offers scarcely any point in which I cannot cordially concur, especially when speaking of the high competency of William von Humboldt in respect to the Basque language and ethnology. It is, in fact, impossible to dispute the superiority of that eminent philologist, on this special question, over every modern writer not by birth a Basque. The idea on which I insist the most is, first, that as it would be presumptuous to affirm that language is always a test of race, so it would be at least as hazardous to declare that anthropologists should invariably dispense with such test. We cannot, in

fact, deny that the modern Cornishman, though Kelt, speaks English; that the Shetlander and the Orcadian Scandinavian speak Scotch; that a large proportion of Livonians, though of non-Aryan, Uralic race, speak only the Aryan, Lettonian, and so on. Secondly, that, nevertheless, these are merely exceptional cases, fortunately easy to be explained by modern history. Exceptions prove the rule, and I willingly admit that the exceptions are numerous. But are they sufficiently numerous to destroy the rule? Certainly not. For it is self-evident that the inhabitants of France and Spain who speak Basque, that those of the British Isles and of France who speak Keltic, that those of Livonia who have preserved the Uralic tongue, &c., &c., preserve, even by the avowal of anthropologists, the anthropological character which the language has beforehand indicated. In a word, if an unimportant minority of philologists pretend to dominate as despots over the anthropological science, they are wrong. But the minority of anthropologists who maintain that language should never be considered in the determination of race are still more in error.

Dr. BEDDOE communicated the following note:—I am anxious to have an opportunity of saying that, if I rightly apprehend the nature of the views held by Mr. Dawkins and by the author of the paper, they are not incapable of being harmonised. With respect to the northern limit of the Basques, or rather of the Euskarian races, the investigations of Broca and his collaborators, summed up in a masterly paper just published in the *Revue d'Anthropologie*, prove the existence of a distinct ethnic frontier near St. Jean-de-Luz, to the south of which prevails the comparatively pure Basque type, characterised by occipital dolichocephaly and extreme orthognathism; but to the north a somewhat brachycephalic and even slightly prognathous type, which abounds through a great part of the south of France, and is called Keltic by Broca and by most French anthropologists.

On the other hand it must be allowed that good observers, such as Mr. Dawkins, find a certain degree of resemblance between the true Spanish Basques and the modern Aquitanians, not only those to the south-west of the Garonne, but even those beyond that river, and some extend the supposed likeness to the Bretons. Furthermore, a type not unlike the Basque is found in the country of the old Silures, whom Tacitus believed to resemble the Iberians. The generally accredited resemblance between the Spaniards and the western Irish cannot be quoted here with any confidence, for the Spaniards are a heterogeneous people, and the Irish-like element among them may not be Basque; still, there are many other reasons for suspecting an Iberian element among the Irish. Again, Dr. Mitchell calls one of his Highland-Gaelic types "the Spanish Kelt," and his description of this type agrees pretty well with the Basque one; and Hector Maclean finds some apparently Euskarian words in the Gaelic of the West Highlands. And, to return to the south of France, the skulls from the cavern of the Homme Morte, in the mountains of the Lozère, where the modern

population is short-headed, are extremely long; and a single glance at them, as figured by Broca, immediately directed my thoughts to the Basque type, to which I afterwards found that they had been likened by my illustrious friend. I need not now enter on the questions connected with the ancient British long heads and Thurnam's ideas respecting them.

On the whole, there is a great deal of evidence in support of a hypothesis analogous to that of Retzius, yet widely different—the hypothesis of a dolichocephalic race, Euskarian, though not necessarily Basque in the narrower sense, which may have overspread Western Europe, from Cape Wrath to Gibraltar, and North-western Africa besides, before the arrival of any race which anybody would now recognise as Celtic.

The considerable proportion of brown or lightish hair, said to occur among the Spanish Basques, need present no difficulty, even to those who believe in the permanence of hair colour as a race-character. The same colours occurred in the Roman period among the supposed Iberians of the south of Spain: they have been recognised among the inhabitants of Northern Africa for more than 3,000 years, and among the Guanches since their discovery. The greater predominance of dark hues among the modern Gascons seems to indicate that the principal race which has crossed the aboriginal Euskarian people must have been extremely dark. This I believe to have been the Ligurian stock, which occupies on the map of Europe a large area, conterminous with that of the brachycephali of Central Europe, with whom, however, I do not at present incline to think they are in any other way related.

Professor BUSK agreed with Dr. Broca in his determination of a dolichocephalic type of skull among the inhabitants of Guipuzcoa, and that it is typically Basque. Twenty-one per cent. of the French Basque-speaking people are brachycephalic. He remarked on the close similarity, almost identity, of the Basque area, as depicted by Prince Lucien Bonaparte in his maps, and by Dr. Broca in his memoir, determined, as it would seem, upon totally independent data.

Mr. HYDE CLARKE considered that Mr. Dawkins was justified in the main in the position he had taken up; at the same time it was impossible to concur with him in his neglect of the philological considerations. No anthropological investigation could be complete which excluded philology. The Basque language is in itself a great anthropological fact. Dr. Webster greatly relied upon W. von Humboldt's investigations, and these are to be regarded with attention, for there is nothing more valuable and more certain than the study of the names of places, as a branch of philology and history, when properly applied. In the then state of knowledge, Von Humboldt had been induced to extend the Basque area too far, and to include in it the Iberian. It is here that we have to seek the true solution. The Iberians must have been a civilised people later than the Basques, and cognate (as he had stated in his paper in the *Journal*, vol. iv. p. 148 *et seq.*) with the Sumerians in Italy, Greece,

the East, and throughout the world. The Kelt-Iberian inscriptions are in favour of this, and deserve careful study. The diversity of populations in the Basque and the allied countries was because they included not only a Basque element but an Iberian element, and this has to be accounted for. Indeed, it is futile, in the thousands of years to be allowed for, to suppose that one race alone existed; nor does the distribution of skulls as dolichocephalic and brachycephalic suffice for the ethnological phenomena. If Mr. Dawkins had profited by the philological evidence, and particularly by that offered by him (Mr. Clarke), it would have strengthened his position. The Basque language was undoubtedly allied with those of dark populations in Africa and India; with the Houssa, Mandingo, and Fanti, &c., of West Africa; with the Kolarian, Sonthal, &c., of Central India, at an epoch when, as language showed, the populations were leaving caves (wherein Mr. Dawkins sought their remains) and establishing themselves in tree-abodes and houses, and were passing from an age of stone to one of bone and wood. With regard to the so-called Turanian influence, which had been detected in Irish and in Erse, he doubted that this could be called Basque, as it was much more likely to be Sumerian; and for this a comparison with Accad is desirable, and also an investigation into the names of places in the western Keltic countries. As to the phenomenon of vocalic euphony, that is not peculiarly Aryan, but is found much more widely distributed than is supposed, and is an early fact in prehistoric philology. With regard to Dr. Webster's denunciation of specialisation, it is impossible to concur in it, because, in the present state of anthropology, no one man can of himself apply all the requisite modes of investigation. Nothing is more common for naturalists of the highest scientific standing to profess an utter ignorance of philology, for instance, and to give proofs of such ignorance. The world is, therefore, under great obligations to those who, like Mr. Boyd Dawkins, Prince Bonaparte, Professor Huxley, Mr. Buek, and Colonel Lane Fox, each bring special knowledge and a distinct system of inquiry to bear, assisting one another and contributing to the general labour.

The Rev. A. H. SAYCE said: Not only do I fully agree with Prince Lucien Bonaparte, that the philologist who makes language the test of race is a bold man, but I would go further and say that language cannot be the test of race at all, but only of social contact. We cannot argue from the exceptional phenomena of the stereotyped families of Aryan, Semitic, and Turanian speech. Savage and barbarous dialects are in a constant state of flux and change; while conquest, migration, and other causes, occasion the borrowing of new languages and the loss of old ones. Passing on to the paper just read, it seems to me that Mr. Webster and Mr. Boyd Dawkins are really substantially in agreement, and that the apparent difference between them results from a misunderstanding, Mr. Webster having interpreted in a narrow sense the term Basque, which Mr. Boyd Dawkins used as equivalent to Iberian. Mr. Webster allows that the Basques belong to a "Turanian" population once spread over

the west of Europe, and speaking an agglutinative language, and this is precisely what Mr. Boyd Dawkins asserts. The Basques, physically and linguistically, are the representatives of a race which preceded the Kelts, and were driven by them into the mountain fastnesses of the extreme West, just as the Finns were by other Aryan tribes in the North. Just as the existence of light-haired persons among the Basques shows only that mixture of blood which was to be expected, so, from the present state of the Basque language, we cannot draw any conclusion against the view that the primitive population with whom the Aryan Kelts came into contact spoke older but cognate dialects. The oldest Basque with which we are acquainted does not date back beyond three or four centuries; before that time there was no literature, and the changes undergone by languages other than literary are astonishingly rapid and extensive. The few native inscriptions of early date found in northern Spain, so far as they can be deciphered, show little resemblance to modern Basque, while Strabo (iii. p. 139) states, that not only had the Iberians many different dialects, but several different alphabets as well. This points to want of intercourse, bringing with it a great diversity of language. Numerous as these languages were, however, they must have had a general resemblance to one another, since Strabo (Book iv.) says that they were like the idioms of Aquitania, in contradistinction to those of Keltic Gaul. The modern French Basque dialects are not descended from any of those of Aquitania, since their speakers first entered France after the fall of the Roman empire, but they would be later descendants of some cognate dialect or dialects. Basque is the sole survivor of what may be called the Iberian family of speech, which was displaced by the Keltic invaders. It is useless to seek for traces of Basque words in local names, whether in France or elsewhere. Basque is too modern to allow us to know the forms of its words even a thousand years ago, while nothing is so soon corrupted as a proper name. Humboldt's attempt to explain local names in Western Europe by means of modern Basque is necessarily a failure. Until the Keltic vocabulary has been thoroughly examined, and its non-Aryan residuum made out, it is impossible to compare it with those Basque roots which have been extracted from a comparison of the Basque dialects. Grammar and idioms alone can inform us whether the Keltic languages have come under the influence of their Iberian predecessors. If non-Aryan forms and idioms can be pointed out in Keltic similar to those found in modern Basque, philology will have done all it can to support the theory that the population found by the Kelts in Western Europe was one of which the Basques, physically and linguistically, are the best modern representatives.

Mr. J. RHYs spoke as follows: The evidence of language on the question before the meeting is very precarious, owing partly to the difficult position of Basque philology, the oldest manuscript specimens of Basque being, as I am told, only two or three centuries old. A comparison of the vocabulary of Basque with the vocabularies of

the Keltic languages would not be of much use, especially if those languages are taken in their modern form. Now, we have Irish and Welsh of the eighth century, without taking into account the data supplied us by inscriptions dating two or three centuries earlier; and if Basque scholars, by a careful examination of the Basque dialects, can infer the rules of phonology which have obtained in them, and thereby restore, as it were, the parent speech from which they have branched, that parent speech might be advantageously compared with Old Irish and Old Welsh. Until that can be done it avails little to appeal to philology against Mr. Boyd Dawkins' theory, and supposing it done, the result would not, perhaps, be so completely hostile to his theory as Mr. Webster seems to think. As matters now stand, I fail to discover many points of similarity between Basque and Keltic, of such a kind as would suggest that the Keltic nations had at any time absorbed Basque ones. The only one I happen to recollect is the incorporating nature of the verb in Basque, Old Irish, and, to a slight extent, in Old Welsh. For my part, however, I look with more confidence for the explanation of the non-Aryan traits of the Keltic tongues in another direction, namely, to the family of languages represented by those spoken by Finns and Hungarians at the present day. Thus I would, with the utmost diffidence, suggest that the pre-Keltic inhabitants of those islands formed the missing link between the Basques of France and the Finnish nations of the Baltic.

Mr. W. J. VAN EYS said that Humboldt's theory on the origin of the Basques, and of their language, has been so much opposed of late that it does not appear sufficient to quote his name as an authority. If I am not mistaken, the Rev. Mr. Wentworth Webster, in his paper quotes the eminent German philologist, without giving any reason why he thinks that Humboldt is right in his assertion that the modern Basques and the ancient Iberians are one people and spoke one language. But not long ago the Rev. Mr. Webster treated the same subject in the *Academy*, No. 134, and there he tried to explain that the opposition to Humboldt's theory arose from not observing the difference of the conditions of two very different problems—the first: What is the original language of certain names in Spain which we find in a Greek and Latin dress? the other: What is the language of the so-called Iberian inscriptions? This, most probably, was still the Rev. Mr. Webster's opinion when he mentioned Humboldt's name in his paper just now alluded to. Mr. Webster mixes his theory with that of Humboldt, and produces some confusion. The second problem stated by the Rev. Mr. Webster has not been touched by Humboldt. He expressly says that he will not try to explain the so-called Iberian inscriptions. The first problem only is the subject of Humboldt's essay, with this difference, that the Greek and Latin dress in which some Basque names may appear is a suggestion of the Rev. Mr. Webster—a valuable suggestion, perhaps, but it belongs to Mr. Webster and not to Humboldt. That the latter is aware of the influence of Greek and Latin in the tran-

scription of Iberian names is a matter of course (see Prufung, p. 5); but, as a rule, his etymological explanations are based on what he thinks to be the phonetic system of the Basque language. As it has now been possible to prove, by a better acquaintance with the Basque language, that Humboldt's attempt has completely failed, the results obtained by him have not the value which has generally been supposed they have. If ever it will be proved that the Basque language is derived from the Iberian, it will have to be done by quite different arguments than those of Humboldt. The opposition to his theory arises from the discovery that he did not possess sufficient knowledge of the language. I do not wish to criticise the Rev. Mr. Webster's remarks for my own sake, but for the right understanding of Humboldt. The question, as he puts it, is a purely philological question, which has to be decided by philological arguments. Humboldt's language is very clear; and in order not to leave any doubt as to what he meant, I might quote some of his conclusions. On page 120 we read—"The ancient Iberians are undoubtedly Basques." On page 177—"The comparison of the ancient local names in the Iberian peninsula with the Basque language proves that this (Basque language) was the language of the Iberians." On the same page—"The terms of Iberian peoples and Basque-speaking peoples have the same value." On page 22—"What has been said in the preceding paragraphs will be sufficient to demonstrate that the formation of the ancient local Iberian names is generally concordant with the Basque phonetic system." It is, consequently, not quite correct, when Humboldt pretends that *ulia* is the same word as Basque *ura* (water), to explain this as if Humboldt had meant to say that *ura* appears in its Latin dress as *ulia*. If Humboldt had wished to say so, he certainly would have done it. No more is the Rev. Mr. Webster's conclusion correct when he says—"So that Humboldt was fully warranted in considering the many names of streams beginning with *ur* as *prima facie* Basque." No one, I think, will dispute that *ur* is *ur*, but it is disputed that *ulia* is *ur*.

Professor HUGHES thought that the case before them was very similar to one which often occurred in geology, where two beds had to be correlated, one of which contained fossils, and the other contained none. It can be shown that they are on the same horizon by other than paleontological evidence, and then the fossiliferous bed enables us to make out what that horizon is. So it seemed to him that Professor Dawkins had given reasons other than philological for identifying an ancient race which formerly occupied a large part of S.W. Europe with the Basques. Of course, in the case of the extinct, or, rather, absorbed race, there could be no language to compare with that of the Basques, except, perhaps, a few words and idioms, like derivative fossils in a new bed. The existence of a large Turanian element in the Basque language was allowed. The occurrence of two types, the melanochoic and xanthochoic, among the Basque-speaking population was not questioned; but Professor Dawkins pointed out

reasons for believing that the xanthochroic were the newer part, who had been absorbed by the stronger people among whom they had arrived. Having, then, shown that the remains of the earlier neolithic people prove that they resembled the Basques in their physical characters, having pointed out which type of Basques is likely to represent the original stock, Professor Dawkins goes on to explain, from an examination of the remains found, and of the physical characters which have been transmitted to the populations of S.W. Europe, what was the northern range of the earlier neolithic people, whose nearest representatives he has given reasons for believing are now seen in the dark type of Basques.

The PRESIDENT thought that the Institute was much indebted to Mr. Webster for his interesting paper, and to Mr. Boyd Dawkins for his remarks in reply. It was difficult to say which had made the most of the scanty data at their disposal. He thought the meeting would at once perceive that what was really wanted, in order to throw light on this subject, was more complete and careful statistics as to the form, colour, stature, and psychological peculiarities of the Basques, conducted upon the principles laid down in the "Anthropological Notes and Queries for Travellers," lately published under the direction of a committee of the British Association. He did not think we should ever obtain really satisfactory statistics upon the population of civilised countries until they were conducted under the auspices of the governments of those countries. Under government authority, really valuable returns might be obtained, without imposing any great burden upon the people; and he hoped the time might come when anthropological societies would be in a position to urge upon their respective governments the importance of aiding them in these and similar inquiries. He would not, at that late hour of the evening, and after having heard the opinions of so many distinguished philologists, detain the meeting with any remarks of his own upon a subject which he had not made his special study; but he would ask them, in addition to the thanks which they had already accorded to the authors of the evening's discussion, to make their especial acknowledgments to Prince Lucien Bonaparte, who was recognised as the best living authority upon the Basque language, and who had come there to give the Institution the benefit of his remarks upon this most interesting inquiry. To him the Institution is also indebted for the two admirable maps, showing the distribution of the eight dialects of the Basque language, which hang upon the walls.

The AUTHOR was not present to take part in the discussion.

Dr. J. Simms and Mr. Charlesworth having offered a few remarks, the meeting separated.

FEBRUARY 23RD, 1875.

Colonel A. LANE FOX, *President, in the Chair.*

The minutes of the last meeting were read and confirmed.

The following new members were announced, viz.:—EDWIN LYNN, Esq., Assist. Sup. Kamun Coal Fields, Hyderabad, Deccan; J. SIMMS, Esq., M.D., 337, Strand; CHARLES H. READ, Esq., 103, Victoria Street, S.W.; and WILLIAM HENRY HORNBY STEER, Esq., Apsley House, Whitechurch, Monmouth.

Mr. R. B. HOLT exhibited models of canoes, winter and summer huts, sleighs, caiques, and figures of Esquimaux, all of native manufacture.

Captain HAROLD DILLON exhibited a series of flint implements, &c., found in the neighbourhood of Ditchley, Oxon, and described them in the following note:—

On FLINT IMPLEMENTS, &c., found in the neighbourhood of DITCHLEY, OXON. October, 1874, to February, 1875. By Captain HAROLD DILLON.

THE flints exhibited were found in the parishes of Spelsbury, Stonesfield, and Kiddington, county Oxon. It will be seen, on referring to the 45th sheet, Ordnance Map, that two water-courses or streams fall into the Glyme river about one mile west of Wooton. One of these comes from Lidstone, Enstone, Kiddington, Glympton, and the north.

The other, which comes from the west, rises near Bottom Wood, and is largely fed by a spring formerly known as Spurnill's, or Spurling's Well, situate one mile due south of Ditchley House. Thence it passes, at the foot of Devil Pool Hill, through what was Devil's Pool (now dry), and so on, with high ground on each side.* At the foot of King's Wood (now cleared) was formerly situate Boxden Lake, the south boundary of Enstone parish, here separated by it from Stonesfield parish. The stream passes through the site of Boxden Lake (now dry), and thence along the foot of the hill on which is situate the Roman villa of Callow Hill, and so by Glympton Assarts to Slape Bridge, where it joins the Glyme. The north bank of Boxden Lake is now woodland, but the south bank, shown as King's Wood, was cleared some thirty years ago. The surface of King's Wood is fairly scattered over with flint chips and implements. Quite one-half of the arrow-heads shown (44 in number) were found on this place.

* Boxden Lake and Devil Pool appear on a map of 1726. Boxe Wood mentioned 1300. See vol. xxvii. *Archæa*.

To the north of the stream will be seen Out Wood. A large portion of this has been grubbed within thirty years, and on the cleared portion, and also on the ground between that and the stream, many flints were found. Large portions of the land on the north side of the stream are now covered with wood, and could not be examined in consequence.

The high ground on both sides of the stream, and particularly that on the south bank, possesses advantages which must have led to its occupation by the flint-using people. A high ground, with easy access to, and the command of the water, was an advantage which would be appreciated by the Romans in the location of the villa on Callow Hill, as it had been by the flint-using inhabitants of the locality now called King's Wood. Here on Callow Hill, as in Colonel Lane Fox's discovery* of Roman remains on Devil Pool Hill on the north bank, and also near Bottom Wood on the south bank, flints have been found in the immediate neighbourhood, and, indeed, sometimes mixed with fragments of Roman tile.†

The existence of large woods in this neighbourhood limits the examination of the ground; but the new survey which will be completed in two or three years will, it is hoped, bring some new features of the ground to notice. Captain Ferrier, R.E., who is in charge of the survey party in these parts, takes an interest in archæology, and is secretary of the Oxford Architectural and Historical Association.

One of the most important features of this neighbourhood is doubtless Gryme's Dyke, not only from itself, but from the apparent relation it bears to the presence of flints. This dyke, which has been described by Plot, Stukeley, Warton, Jordan, and others, with various opinions as to its origin and use, is shown in part on the Ordnance Map. It starts from near Ramsden, and, passing through Cornbury Park, by Charlbury, and so on past the north side of Ditchley Park, soon after enters Out Wood, and curves round toward *Woodleys*. Thence it passes into Blenheim Park and falls into Akeman Street, near North Lodge. Ditchley is supposed to derive its name from this dyke, within which it is situate.

Now, having examined a large portion of the land outside of this dyke, as well as all the land between it and the stream before referred to, I found that flint chips, &c., only existed in any quantity on the inside of the dyke. Outside the dyke the flints ceased at once, and often none at all were found for a mile

* See "*Jour. Ethno. Soc.*," vol. i. p. 1 *et seq.*

† On this site, near Bottom Wood, are three tumuli which do not appear to have been yet examined. There is a story of a stone coffin having been found here, but the spot is not now known where it was re-interred.

or more. Of course near tumuli and megalithic monuments a few have been found, but very few. In fact, with the exception of a scraper I found at Lidstone, I may say I found no implements outside. Colonel Lane Fox mentioned, in the paper referred to, that all the flint found here must have been brought from at least nineteen miles to the south, this being an colitic sandstone district. During the ninety days or so that I was examining this part of the country, I picked up every fragment I saw, and the whole would not fill a bushel basket.

Of course the fact of *not* finding flints outside is but weak evidence against their existence; but if such should prove to be the case for some years after regular cultivation, it would, I think, be *some* evidence toward considering the dyke as in some way connected with the former occupation of these parts. That it was not a road is clear; and the care shown in keeping the command of the outside country (at least in most places) points to its having been a defensive work for some settlements on the inside of its curve.

As evidences of a continuous occupation of the ground on both sides of Boxden Lake, I may mention that I found, within a short distance of each other, flints, Roman tile, a piece of bronze, a penny of Ethelred, and an early 17th century clay pipe. This ground, however, had wood on it till within about thirty years, though it would be difficult to prove that it had been wooded since the mention of Edward the First's perambulation of Wychwood Forest, at which time it must have been nearly in the centre of that forest.

I examined carefully several watercourses in the neighbourhood, both within and without the dyke, *e.g.* one from Fulwell to Radford; one from Lee's Rest to Fawler; one from Shire Wood to Stonesfield; one from Ditchley to Kiddington, &c; but I found no flints to speak of on the banks of any of these. Near the Roman camp at Knollbury I found a few flakes, and others near Taston. Cores, flakes (none exceeding $3\frac{1}{2}$ inches long), and chips were found with the scrapers and arrow-heads; but the only pieces bearing marks of grinding were the chisel and two pieces of broken celts, one of which has been used as a hammer.

DISCUSSION.

The PRESIDENT said that Captain Dillon's paper, though short, represents a large amount of time and attention devoted to the investigation of the particular question which arises from the relics discovered in this locality, and it is important, because accurate in its results. He has devoted ninety good days' work to the subject, and having walked with him two or three times over portions of the ground, I know how indefatigably he has followed the matter

up. Seven years ago, in a paper which was published in vol. i., new series, of the "Journal of the Ethnological Society," I drew attention to the existence of a flint-folk settlement in this spot, in association with Roman remains on the same sites. The interest of the locality, as Mr. Dillon has said, is increased by the fact of its being in the oolite country, nineteen miles from the nearest flint deposits, and the distribution of the relics of the flint-workers can, therefore, be traced with far greater clearness than in a country where flint is common in the soil. Every atom of flint found here must have been imported by the hand of man. The flints which I then found, some of which are figured in the "Ethnological Journal," were found within the area enclosed by the dyke, but my examination of the country did not go far enough to determine whether they were confined to the dyke enclosure, or distributed equally over the surface in the surrounding neighbourhood. I was led to conjecture that, although dykes in general in this country are certainly not Roman, this particular dyke might have been of Roman construction, because it covers and defends, from the north, the sites of at least three Roman structures, including one fragment of a mosaic pavement, within the space of a mile. Akeman Street runs in an east and west line from Asthal to Bicester; the Roman sites are close to the north of this Roman road, and the dyke covers the north side of them, running in a good defensive position, somewhat in the form of the arc of a bow, and having Akeman Street more or less in the position of the string of such a bow. The light which Mr. Dillon has thrown upon the question consists in having carefully examined nearly every yard of ground within the area coloured upon the map, which extends for some miles to the outside of the dyke, and by that means he has ascertained that the flints are confined chiefly, if not exclusively, to the area defended by it. We have, therefore, two propositions to consider,—either that this area was occupied in the stone age by a settlement of prehistoric Britons, and subsequently the same sites were occupied by the Romans; or else some of the British tribes employed by the Romans may still have used stone implements. With respect to the dyke itself, it may be of either period; but the fact of its serving to defend the area of the Roman structure, and their communications with Akeman Street, from any incursion of barbarians from the north, seems to imply that it is Roman. The truth can only be ascertained by excavations in the ditch of the work. If flint implements were to be found on the original bottom of the ditch, they would, in this soil, suffice to determine the period. The President concluded by saying that he had himself excavated a few feet of the ditch near Ditchley Park, and found a single flint-chip near the bottom, but this was not enough to build any theory upon.

Sir DUNCAN GIBBS remarked that the flint implements exhibited were much smaller in general dimensions than those usually found in England; this applied more especially to the arrow-heads, which, though very perfect, were not one-half, or even one-third, of the general size.

Mr. Brabrook read the following paper for the author :

On the MILANOWS of BORNEO. By Lieut. DE CRESPIGNY.

A FEW remarks upon the Milanows, or Malanaus, may not be unacceptable to the Institute, as I do not remember to have read in any book published on Borneo, anything more than a mere allusion to them, and as they are an interesting people, with a tendency to increase in number, it may not be out of place to tell you what I know of them.

They are, then, a tribe who inhabit the low countries between Bruni and Tanjong Agri. They seem to have a common language, which is, however, much diversified in different rivers, causing the dialect of one place to be difficult to be understood by a man coming from a more distant one.

As to their origin, I am inclined to think, from the similarity of religion, that they may claim descent from the same ancestors who were the progenitors of the inhabitants of Timor and the Moluccas, and, I think, also the Kyans, who certainly entered this country from the east, may claim clanship with them. I should not consider either the Kyans or Malanaus entitled to be called aborigines of the country, nor the Dayaks, who seem to have come from the south and south-east, and to have gradually worked their way up the great rivers, pushing the aborigines before them.

The Malanaus are an industrious and well-to-do people. They are rich in sago plantations, and they are also expert and bold fishermen. They are not a handsome race, whatever may have been said to the contrary, both sexes being ill-formed, as a rule; the women especially so, being short and squat, and, long before middle age, becoming very obese. They are litigious, and they have less regard for truth than their neighbours the Malays and the Dayaks. But they are good-natured and hospitable; the men avoid ostentation, and very seldom array themselves in rich costume, but like to see their women wear gold ornaments and clothes of fine stuff fringed with valuable beads. In old times these people must have had a very precarious, and, for the most part, a very short existence. Harassed on land by the Dayaks, and at sea by the Lanuns, they lived in constant fear of their lives, whether in their plantations or fishing boats. Moreover, their rulers, the Malays of Bruni, as may be supposed, did not live upon them for nothing; and to find a family who were altogether freemen was almost impossible, grown-up people being taken into slavery from inability to pay fines, and children from inability of their parents to pay debts. However, things are different now, and I believe it is really the case that the population of this district of Mukat has doubled itself within the

last ten years, which is about the time the country has been under Sarawak rule.

I must now say something about their religion. They believe in another world which is like this, having rivers, seas, mountains, and sago plantations. There is one Supreme Deity named "Ipu." There is a beautiful female spirit named "Balu Adad," who conducts departed souls to their future abode, but not until the three or four days' feasting and cock-fighting is over and the corpse has been conveyed to its resting-place. The narrow road leading to Elysium is guarded by a ferocious double-headed dog, named "Mawiang," to whom it is necessary to present a valuable bead. This bead is always carefully fastened to the right arm of a corpse, with whom are buried gold ornaments, weapons, gongs, and rich clothes for use in the other world, and at whose tomb it was formerly the practice to bind a slave, or sometimes as many as ten slaves, who were left thus miserably to die, that their spirits might wait upon their master. All people who had met with a violent death, except those just alluded to, had their paradise in a different place from that which constituted the abode of those dying naturally, a country further back. The Malanaus believe that, after a long life in the next world, they again die, but afterwards live as worms or caterpillars in the forest.

There are several spirits who haunt the woods and streams; they are malignant, and afflict mankind with various diseases. Tow, Dalong, Doig, and Balanyan, are spirits of the woods; Gin, of the sea; Naga, of the rivers. Deog Ian, the spirit who afflicts with dropsy, lives at the sources of rivers. Iblalangan Langit is a winged spirit, inhabits the sky, and kills with thunder and lightning. Siag and Abong send fever and ague upon mankind. There are various ways of propitiating these spirits; by hanging festoons of plants before the house; by making fictitious prahus of sago-pith, and either setting them up at the mouths of rivers or letting them float out to sea; by calling in sorcerers to swing in the house all night to the sound of all kinds of gongs, while feasting is kept up the whole night, and the sick person carried down in a boat next morning to smell the sea air; by making images of the spirit, and paying the sorcerer to abuse the image. With all this the people cannot be called superstitious, for they only seem to perform these rites as a matter of custom, never assuming any air of religion nor making any prostration, nor uttering any prayers to the spirits while performing them, but evidently hoping the sick person will be satisfied that nothing is left undone which should be done under the circumstances. You will see by the above lines, that although in the generality of cases, as regards semi-barbarous people, there is a nauseous

similarity in accounts of their habits and cultus. There are points in those of the people under description of sufficient originality to induce me to hope that the account of them will prove interesting. There do not appear to be any religious services performed except as above—intercession for the sick. But taboo on various occasions is exercised; and, like other people of the country, the Malanaus have their omens.

As dialects of the inhabitants of North Borneo seemed acceptable, I indite one of the Malanau language, as spoken in the district of Mukat.

| ENGLISH. | MALANAU. | ENGLISH. | MALANAU. |
|------------------|----------|----------------------|-----------|
| Ant | Ngad | Hard | Sahih |
| Ashes | Abau | Head | Ulsu |
| Bad | Jaat | Honey | Ayer madu |
| Banana | Badak | Hot | Laso |
| Belly | Nga-ai | House | Lebo |
| Bird | Manuk | Iron | Besi |
| Black | Bilam | Island | Pulau |
| Blood | Dah | Knife | Uji |
| Blue | Biruk | Large | Mat |
| Boat | Saloi | Leaf | Dann |
| Body | Bia | Little | Umit |
| Bone | Tulang | Louse | Kuta |
| Bow | Pamah | Man | Alai |
| Box | Kaban | Mankind | Tenawan |
| Butterfly | Balabang | Mat | Pan |
| Cat | Sieng | Monkey | Kuyad |
| Child | Anak | Moon | Bulan |
| Chopper | Parang | Musquito | Kias |
| Cocoanut | Beniu | Mother | Tina |
| Cold | Singoa | Mouth | Moba |
| Come | Kidigau | Nail (finger) | Silu |
| Day | Lau | do. (iron) | Paku |
| Deer | Payau | Night | Lamai |
| Dog | Aso | Nose | Nio |
| Door | Banawang | Oil | Nio |
| Ear | Linga | Pig | Babui |
| Egg | Teloh | Post | Di |
| Eye | Mata | Prawn | Undang |
| Face | Jauei | Rain | Ujair |
| Father | Tamisa | Rat | Labau |
| Feather | Bulau | Red | Sak |
| Finger | Tujuk | Rice, in husk | Padai |
| Fire | Apoi | Rice, raw | Bras |
| Fish | Jikan | Rice, boiled | Nasi |
| Flesh | Sei bia | River | Lungai |
| Flower | Bunga | Road | Jalan |
| Fly | Lalangow | Root | Akar |
| To fly | Tiling | Saliva | Liang |
| Foot | Pajag | Salt | Liar |
| Fowl | Siau | Sea | Alud |
| Fruit | Bua | Silver | Pirak |
| Go | Taboi | Skin | Kulit |
| Gold | Mat | Smoke | Tugun |
| Good | Diak | Snake | Dipa |
| Hair | Buh | Soft | Lamak |
| Hand | Pā | Sour | m'sam |

| ENGLISH. | MALANAU. | ENGLISH. | MALANAU. |
|-----------------------|----------|----------------------|------------|
| Spear | Besei | There | gagien |
| Star | Bintang | What | ino |
| Sun | Mata lau | That | ino |
| Sweet | Tami | Many | ida |
| Tongue | J'lah | When | Peia |
| Tooth | Ipan | Who | Lei |
| Water | Niam | Where | gagahan |
| Wax | Lilin | To throw away ... | jiwiek |
| White | Apo | To walk | makau |
| Wife | Saus | To die | matai |
| Wing | Payang | To sit | kuduk |
| Woman | Mahau | To stand up | B'kadang |
| Wood | Kayu | Betel nut | pinang |
| Yellow | Kuning | Sirih | s'pah |
| Green | ijau | To want | Lo |
| Yes | eh | A little | ajumi |
| No | uda | To make | sibat |
| Seek | pinang | To bring | gé |
| Find | k'nah | To take | gé |
| Like this | gatanien | Presently | né |
| Like that | gatanien | Not at all | aké |
| Formerly | Tai | Goods | barang |
| If | Kalau | Arrive at | Tapa |
| To sail | Padu | Now | Ajan itau |
| To run | Pabia | To carry | S'un |
| Ghost | Amo | To drink | Tutang |
| Corpse | Bukang | Daylight | Lau |
| To mix | champur | To cook | Misak |
| Naughty | gauk | To warm at fire ... | Pidau |
| Angry | m'dalu | To eat | kaman |
| Tray | dulang | Perhaps | barangkali |
| Winnowing sieve ... | niru | Don't | Ka' |
| Sieve | ayak | To forget | Leilu |
| To pull an oar | pla | To remember | Singad |
| Blind | mapak | To-morrow | Suni |
| To break | baba | Day after | Sili suni |
| To lie | pamudei | Yesterday | mabei |
| To sleep | tudui | Day before | sili mabei |
| To lie down | p'galang | Boundary | nistan |
| To get up | p'kadang | News | Dangar |
| To awake | ban | Up river | Kamanuju |
| Bottle | botul | Down river | Kalud |
| Tin and lead | timah | Not yet | Madanga |
| To meet | tamu | To lick | Sanilak |
| Headcloth | Bulang | Across the river ... | Ipa |
| Neck | Tengo | To use | Bábá |
| Different | Wa ino | Village | Liko |
| Here | gagito | Forest | gün |

Mr. Rudler read the following paper for the author :—

FURTHER NOTES on the RUDE STONE MONUMENTS of the KHASI HILL TRIBES. By Major H. H. GODWIN-AUSTEN, F.R.G.S., F.Z.S., &c., Deputy Superintendent Topographical Survey of India. [With Plates ii. and iii.]

HAVING again visited the Khasi Hills since writing my last paper, I am enabled to give some further details regarding their

rude stone monuments. At the village of Nougshai, near Shillong, are to be seen some very striking monoliths; and although they do not come up quite to the length of those at Nurtiang (noticed by Dr. Hooker in his "*Himalayan Journals*"), yet they are very worthy of being mentioned. They stand on the open spur just above the village, and have been worked out of the beds of the Shillong sandstone series, and some of the smaller blocks have been taken from the conglomerate beds, the lowest in the series, and which come in, in the bed of the ravine, to the north of the spur. There are a number of monuments on this site, large and small, arranged both in line and on two sides of a square; the two largest have their central monoliths—height, 24 ft. 3 in.; width, 5 ft. 6 in.; thickness, 8 in.; and height, 23 ft. 2 in.; width, 2 ft. 9 in.; thickness, 1 ft., respectively.

Plate ii., which is taken from a photograph by Mr. William Robert, Assistant Surveyor in the Khasi Hills survey party, gives an excellent idea of the second largest structure, showing the very massive flat-stone, the "*Mao Kynthai*," in front. This structure consisted of thirteen upright stones, which could not all be brought into the field of the camera; but the six outside stones on the right are shown. Many of the slabs in the adjacent monuments have been overthrown and broken quite recently, perhaps by Sepoys and camp followers from the military station close by. At one time a mountain battery of Eurasian Artillery was quartered there, and I attribute the overthrow of so many of the stones in the neighbourhood to their handiwork, who would look on such amusement as a "*great lark*." The Sepoy (native of India) is not of a mischievous disposition; the European and half-European (uneducated) is markedly so. Thus the monument with the highest stone is imperfect, and it must, when perfect, have been a very handsome one. This is a sad pity, after the time and labour that must have been expended in its erection.

I did not observe any new slabs anywhere in the immediate neighbourhood. Nougshai must formerly have been a large and powerful village; it stands on a naturally very strong position, and old lines of fortification are to be traced on many sides, especially on the approach from the direction of the Falls of the Umiam. These old lines of defence are on a curious system: a ditch and bank have been carried forward from the main defences from 200 to 300 yards down the ridge of the spurs, thus effectually preventing an enemy working round the hill sides below the villages.

This fortified site points to a state of things in these hills when the relations between the large village communities or

clans were very much as we find them at the present day among the Nagas and Kukis, beyond and bordering our present extreme limits, viz. that of constant feud. They are now the quietest, most peaceful, and contented of all the hill people on the eastern frontier.

In my former paper I did not allude to the cairns in these hills, which I am inclined to think are works of greater age than the stone structures. The custom is one that certainly has long since been given up, for I could not obtain any satisfactory account of them. They are only to be seen on the northern side of the Khasi plateau, and Dr. Hooker, in his account of his trips to the Kollong Rock, did not fail to notice them. About Mairaug and towards Nougstou they are very numerous, and always stand on commanding situations. On the path leading down the grassy spur to the stone monuments previously described, near Nougshai, is a very fine large example of a cairn, about eight feet high. They are usually plain hemispherical mounds of earth; but this one is faced all round at the base with slabs of stone about four feet high; they are frequently not higher than six feet. A distant view is shown in Plate iii.

Nowhere is there any trace of the earth that forms them having been excavated close by; it must, therefore, have been carried in some short distance, to avoid unsightly hollows near the structure. I should much like to have dug into one of these cairns, but was afraid to hurt the feelings of the people by doing so. They are very probably cineraries of an earlier form to those now made of stone, and this point it might be interesting to clear up.

Beyond the Khasi area no cairns are to be found, at least I had never come across any until visiting North Manipur last winter (1872-73), where, at the head of the Imphal river, on the direct road from Samaguting, are four fine cairns, all faced with large boulders. They are old, and the Nagas now living in the village near said they had been made by another clan of Nagas, who long ago had gone further north, and the site of whose village had been lately re-occupied by Kukis.

Mr. C. B. Clarke, in a paper read lately before your Institute, refers to the different forms of the cinerary in the Khasi Hills; but he has not quite exhausted the subject, or got further than I did, although with regard to the disposal of the ashes of the dead he gives some further interesting particulars.

As I think that drawings are of very great interest, and better exhibit the many different forms of bone depository or cinerary that have been adopted at different periods by tribes inhabiting localities very far apart, and often quite unconnected affinitively,

I give a sketch of a form of cinerary meriting attention, and not hitherto noticed (Plate iii.). Several of this form may be seen on a low spur near the Bazar of Jeddo at Shillong. The cinerary is above ground, and stands on a slightly raised platform; it consists of four thick stones, about three feet high, set on edge, and capped with a heavy top-stone; and, so far, it resembles the usual form, a figure of which is given in my first paper.* The approach to all these depositories is from the eastward by several low steps, and the whole structure is enclosed on three sides by large flat slabs (in the rough) standing on end—the largest being placed round the cinerary itself, overtopping it by three to four feet, and the remainder, thence diminishing in size, stand on either side of the steps. There are about six such monuments along the ridge of the spur, and I have seen no others similar elsewhere. They have been broken into, and the front stone removed, very probably by camp followers from our regimental bazar, which is close by. There is thus a double probability of their ultimate destruction altogether, should the station be extended in that direction.

EXPLANATION OF PLATES II. AND III.

Plate II.—View of megalithic monuments at Nougshai, near Shillong, Khasi Hills. From a photograph taken by Mr. W. Robert.

Plate III.—View of rude stone cinerary and approach, at Shillong, Khasi Hills, with cairn in the distance: by the author.

DISCUSSION.

The PRESIDENT said that the paper of Lieut. de Crespigny, on the Milanows of Borneo, contained a great deal of extremely interesting information, especially in relation to their religious customs; the author, however, attempted to connect the Milanows with the inhabitants of Timor, through the similarity of their religious beliefs. He (the President) did not venture to express any opinion on this point, not having any grounds for forming one. He thought, however, that, as a general rule, evidence of identity of races, derived from the comparison of the religions of savages, must be received with caution, especially in the absence of any information as to physical resemblance. The attention that is devoted to religion arises from the interest that is taken in the subject, rather than from the value of the evidence it affords of connection with other peoples. There must always be a great liability to error in the accounts of the religious customs of savages. Inquiries into the resemblance of the arts of different people, about which there could be no mistake, were, he thought,

* Read May 1st, 1871.



STONE MONUMENTS, NEAR SHILLONG, KHAIST HILLS





CINERARY AT SHILLONG, KHASI HILLS.



of more scientific value; and the vocabularies given by the author in this paper would, no doubt, be found of great use to comparative philologists. He hoped that the Institute would be favoured with some further information on the races of Borneo from Lieut. de Crespigny.

With regard to the paper by Major Godwin-Austen, he (the President) would say his communications were always welcome to the Institute. He wished that a more detailed account had been given of the intrenchment referred to. There appears to have been a great camp-building period in the life of most races, when neighbouring tribes were constantly at war, and each had its stronghold in case of attack. Such camps are conspicuous amongst the antiquities of nearly all parts of the world, and a comparison of the different systems of defence adopted, when viewed by the knowledge of the art of castrametation which we possess, affords reliable evidence of psychical connections. In the early British camps of this country he had never seen any evidence of the use of flanking defence except at the entrances; but the description given by Major Austin of this earthwork appeared to indicate that something of the kind was known to these people.

The following paper was taken as read:—

HISTORY of the HEUNG-NOO in their RELATIONS with CHINA.
(Translated from the Tseen-Han-Shoo.) By A. WYLIE, Esq.

(Continued from p. 452, Vol. III. of *Journal of Anthropol. Inst.*)

A FEW months after the accession of Hoo-han-seay Shen-yu, the country was restored to a state of comparative quiet, and the soldiers returned to their respective homes. The new chief raised his elder brother Hoo-too-woo-sze from among the people to the rank of Left Luh-le Prince. At the same time he sent to inform the Right Sage Prince of his position. There was a feeling among the nobles that this magnate should have been put to death; but the Shen-yu was more inclined to leniency. Conscious of his unpopularity with those about the chief, the Right Sage Prince deemed it the safest plan to raise a party of his own; and the same winter, in concert with Too-lung-ke, concocted a scheme for elevating the Jih-ch'uh Prince Poo-seu-tang to the supreme power, as Too-k'e Shen-yu. They raised several tens of thousands of troops, and made an attack on Hoo-han-seay from the east; when the troops of the latter were defeated and fled. Too-ke Shen-yu then took possession of the seat of government; appointed his eldest son Too-too-woo-se as Left Luh-le Prince, and the younger, Koo-mow-low-tow as Right Luh-le Prince, whom he retained at the Shen-yu's palace.

In the autumn of 57, Too-k'e Shen-yu appointed the Jih-ch'uh Prince and Seen-heen-tan's elder brother the Right Yuh-keen Prince, as Woo-tseay Commandants, with twenty thousand cavalry each, to plant military colonies on the east, as a safeguard against attacks from Hoo-han-seay. About the same time the Hoo-k'ëe Prince in the west combined with Wei-le Tang-hoo, to traduce the Right Sage Prince, and charged him with the intention of usurping the supremacy, under the style of Woo-tseay Shen-yu. Too-ke, who lent a too ready ear to these reports, had the Right Sage Prince and his son both arrested and put to death; but learning afterwards that it was a false accusation, he seized the accuser Wei-le Tang-hoo, who paid the penalty with his head. The Hoo-k'ëe Prince on this, becoming alarmed for his own personal safety, withdrew, gathered a party round him, and set himself up as Hoo-k'ëe Shen-yu. The Right Yuh-keen Prince hearing of this, immediately set up his claim, under the style of Keu-le Shen-yu. The Woo-tseay Commandant also endeavoured to create a cause for himself as Woo-tseay Shen-yu. Thus there were now altogether five contending Shen-yus in the field at once. Too-ke advanced at the head of his troops to attack Woo-tseay. Keu-le and Woo-tseay were both defeated, and fled to the north-west, where they united their forces with the army of Hoo-k'ëe Shen-yu, making a total of forty thousand men. Woo-tseay and Hoo-k'ëe then agreed to abandon their claim, and unite their strength in assisting to establish Keu-le Shen-yu. When the news of this confederacy reached the ears of Too-ke Shen-yu, he sent his Left Great General and Commandant with forty thousand cavalry to form military colonies, in order to secure the eastern border from surprise by Hoo-han-seay. He then led forward in person a force of forty thousand cavalry to attack Keu-le Shen-yu on the west. Keu-le was defeated and fled to the north-west. Too-ke moved south-west and settled in the Heih-tun territory.

Next year, Hoo-han-seay sent his younger brother, the Right Luh-le Prince with a party to invade the military settlements of Too-ke Shen-yu, when they killed and captured over ten thousand men. On hearing of this catastrophe, Too-ke put himself at the head of sixty thousand cavalry, and advanced to an attack on Hoo-han-seay. After a march of about a thousand *le*, before reaching the Jö-koo territory, he fell in with Hoo-han-seay's army, some forty thousand strong, when a battle ensued, in which Too-ke's troops were defeated, and he committed suicide. Too-lung-ke and Too-ke's youngest son, the Right Luh-le Prince Koo-mow-low-tow, escaped to China. Keu-le Shen-yu came eastward and submitted to Hoo-han-seay.

This chief's Left Great General Woo-le-k'euh, with his father Hoo-chih-luy, and Woo-le-wan-tun, seeing the state of anarchy ruling among the Heung-noo, led their troops southward to the number of several tens of thousands, and tendered their allegiance to China. Woo-le-k'euh was made Marquis of Sin-ching, and Woo-le-wan-tun Marquis of E-yang. About the same time the son of Le-ling again endeavoured to get up a party to establish the Woo-tseay Commandant as Shen-yu; but he was caught and beheaded by Hoo-han-seay. The latter then fixed his court at the Shen-yu's palace; but his forces were reduced by several tens of thousands. Too-ke Shen-yu's relative, the Heu-seun prince, with the five or six hundred horsemen under his command, attacked and killed the Left Great Tseay-keu, and uniting his troops to his own, went to the right-hand land, where he set himself up as Jun-chin Shen-yu in the west. Afterwards Hoo-han-seay's elder brother, the Left Sage Prince,* Hoo-too-woo-sze also set up a claim in the east as Che-che, Kuh-too, Marquis and Shen-yu.

In the year 54, Jun-chin Shen-yu led his troops eastward to attack Che-che Shen-yu, who gave him battle, killed him, and appropriated his forces. Che-che then advanced to attack Hoo-han-seay. The latter was defeated and his troops fled; while Che-che installed himself in the Shen-yu's palace. On the defeat of Hoo-han-seay, the left E-ts'ew-tsze prince strongly urged him to declare himself a subject and render homage to China. By submitting to China, he said, assistance would be obtained, and thus the affairs of the Heung-noo might be settled. Hoo-han-seay then called a council of his Great Ministers and submitted the question to them. The general expression of opinion was:—"By no means! It is the character of the Heung-noo to value independence and disparage submission. By mounting our steeds and fighting for the national cause, we have gained a renown for courage among all the nations, whose sturdy warriors fight to the death. Now we have brethren striving together for the supremacy; and if the elder is unsuccessful, it falls to the lot of the younger. Although they die in the contest, yet they leave an unsullied reputation for courage to their children and descendants, excelling all other nations. Although China is strong, that is no reason why the Heung-noo should be annexed to it. How should we thus subvert the institutes of our ancients, becoming subject to the Chinese, disgracing the former Shen-yus, and being made the laughing-

* This dignitary is named as the Left Luh-le Prince at the beginning of the Shen-yu's reign; but as Too-too-woo-sze, the son of Too-ke, is also said to have been made Left Luh-le Prince the same year, perhaps the similarity of the two names may have induced a clerical error, and it is probable the present is the correct entry.

stock of all nations. Although we should obtain peace at this price, how can we any more be looked upon as the head of the nations." The Left E-ts'ew-tsze then addressed the assembly to this effect:—"Your counsel is not good. Periods of strength and weakness alternate in the history of nations. Now is the period of China's prosperity; Woo-sun with its dependencies, and the other kingdoms have all become subject to it. Ever since the time of Tseay-te-how Shen-yu, the Heung-noo have been gradually dwindling down, and can never regain their former status. Although we exhaust ourselves striving after that, we shall never enjoy a day's repose. Now if we submit to China, our nation will be preserved in peace; but if we refuse to submit, we are running into perdition. We cannot avert this by our plans." This speech was followed by a stormy discussion among the magnates.

After long deliberating on the question, Hoo-han-seay ultimately resolved to follow the counsel of the left E-ts'ew-tsze. Accordingly, in the year 53, he led his army southward to the neighbourhood of the stockades, and sent his son, the Right Sage Prince Choo-low-keu-tang, to reside at the Chinese court as a token of submission. Che-che Shen-yu likewise sent his son, the Right Great General Keu-yu-le-show, to reside at the court of China.

During the whole of the following year Hoo-han-seay Shen-yu was encamped outside the Woo-yuen stockade, waiting for a formal admission to pay court to the Emperor of China in person.

The New-year audience of 51 was to be one of signal honour, as marked by the submission of one of the principal potentates of Eastern Asia, and the ceremonial arrangements were on a corresponding scale. The Chariot Cavalry Commandant, Han Chang, was deputed to escort the chieftain. The route by which it was arranged he should pass lay through seven regions, to each of which two thousand cavalry were appointed to line the highway on both sides as far as the Kan-tseuen Palace, where the Shen-yu had the privilege of prostrating himself before the Son of Heaven. Extraordinary rites were decreed in his honour on the occasion, and his rank was fixed above all the lords and princes of the empire. His act of submission was pronounced with eulogium, without mentioning any name. The imperial gifts were presented, consisting of a cap, a sash, a suit of garments, the gold seal of investiture with an azure ribbon, a jade-ornamented sword, a dagger, a bow, four arrows, ten lances in covers, a chariot, saddle and bridle, fifteen horses, twenty pounds weight of gold, two hundred thousand coins of the realm, seventy-seven suits of inner clothing, eight thousand

pieces of embroidered, figured, and variegated silk, and six thousand pounds of raw silk. When the ceremonial was concluded, a commissioner was appointed to conduct the Shen-yu to his lodging for the night at Chang-ping;* the Emperor himself went to pass the night at Che-yang Palace. On reaching Chang-ping, the Shen-yu was instructed not to proffer the rites of hospitality. His Right and Left Tang-hoos and all his ministers ranged themselves along the road to see the cortège, while the barbarian princes, chiefs, marquises, and lords, to the number of several tens of thousands, all lined the road on both sides below the Wei Bridge, and as His Majesty ascended the bridge they all shouted, "Long live the Emperor."

The Shen-yu next proceeded to his hotel at Chang-gan, the capital, and after a stay of somewhat over a month, he was conducted on his way back. The Shen-yu requested permission to stay outside the Kwang-luh (*banqueting-house*)† stockade, that he might protect the Surrender city of the Chinese in case of emergency. The Chinese sent as an escort the Chang-lo Director of the Guards, the Marquis of Kao-chang Tung Chung, and the Chariot Cavalry Commandant, Han Chang, with sixteen thousand cavalry. There were also considerably over a thousand of the border region troops and horses, who convoyed the chief beyond the Ke-luh stockade in Suh-fang. The Emperor ordered Tung Chung and his colleagues to leave a guard with the Shen-yu, to punish any refractory conduct. From first to last thirty-four thousand bushels of grain, rice, and dried provisions were distributed to the retainers. The same year Che-che Shen-yu also sent an envoy with offerings, who was received and treated with great liberality by the Chinese.

In the year 50 both the Shen-yus sent envoys to China to pay court, with offerings. The greatest favours were conferred upon the representative of Hoo-han-seay.

The following year Hoo-han-seay again attended the audience in person, when the ritual and the gifts were the same as on the previous occasion, with the addition of a hundred and ten coats, nine thousand pieces of embroidered silk, and eight thousand pounds of raw silk. As there were now military colonies, no cavalry escort was sent with him. At first Che-che Shen-yu, considering that Hoo-han-seay had submitted to the Chinese, conceived that his army would be so enfeebled that he would be unable himself to return. The former therefore took

* A place on King River, about fifty *le* to the south-west of King-yang district city, in Segau, the capital prefecture of Shen-se.

† So named as the first of the line of defences erected by Seu Tze-wei, the banqueting-house magnate, from Woo-yuen outwards. (See *Shanghai Evening Courier*, August 25, 1873.)

his troops westward, intending to attack and settle the right-hand land. The youngest brother of Too-ke Shen-yu, who formerly waited on Hoo-han-seay, also took a portion of the deserted right-hand land, and with the remaining troops of his two elder brothers, to the number of several thousands, set himself up with the style of E-le-muh Shen-yu. Meeting with Che-che on the way they joined battle, when the latter killed his antagonist, and annexed his troops, over fifty thousand, to his own army. Hearing that China was raising troops and assisting Hoo-han-seay with funds, he fixed his dwelling in the right-hand land; but suspecting his force was insufficient to conquer the Heung-noo nation, he went still farther west, to the neighbourhood of Woo-sun. Wishing to gain the co-operation of that kingdom, he sent an envoy to the young Kwam-me (*king*) Leang-ke-woo. The latter, however, seeing that Hoo-han-seay was sustained by the Chinese, with whom he was desirous to ingratiate himself, and knowing Che-che to be but a refugee, he caused his envoy to be put to death, and sent his head to the Protector-General. He then sent eight thousand cavalry to meet Che-che, who, seeing such a numerous Woo-sun army, while his envoy had not returned, suspected how matters stood, and urged his own troops on to the attack. Woo-sun was defeated, and Che-che moved north to attack the petty kingdom of Woo-kee. That state having submitted, he next moved westward, and defeated Keen-kwan.* On the north he brought the Ting-ling under subjection, and annexed their king and kingdom. He made several attacks on Woo-sun, and was always victorious. Keen-kwan, where Che-che made his metropolis, was seven thousand *le* west from the Shen-yu's palace, and five thousand *le* north of Keu-sze.

The Emperor Yuen-te had just ascended the throne in 48, when a letter from the Shen-yu announced the fact that his

* A native commentator tells us that this is the nation known as Kee-kuh at the beginning of the Tang, and Hea-kea-sze at the end of the same dynasty. On this term, Phillips says:—"The ancestors of the Kirghiz of our day. They are probably a people of Samoyade race blended with the Ting-ling, who belonged to the same fair race as the Woo-sun. Under the Han, 200 a.c., the Hakas were called Keen-kwan, and it was not till the time of the Tang dynasty, 700 a.d., that they received the name of Hea-kea-sze. Their settlement began to the west of the Ouigours and to the north of Yen-ke or Karashar, and extended northward as far as the Irish and the Ob in southern Siberia. The men were of tall stature, with light hair, fair complexion, and blue eyes. These people were formerly commingled with the Turkish and Mongol tribes, which made them lose their ancient language, in the place of which they had adopted the Turkish dialect. This commingling with these tribes has not, however, quite destroyed the characteristic marks of their external appearance, for one often still sees, among the Kirghiz, people with red hair and blue or green eyes."—Doollittle's "Vocabulary and Handbook," vol. ii. p. 209.

people were suffering extreme distress from poverty and famine. By imperial order, twenty thousand bushels of rice were forthwith distributed among them, from the regions of Yun-chung and Woo-yuen.

Seeing the protection and patronage his rival Hoo-han-seay was receiving from the Chinese, the jealousy of Che-che was roused; and in view of the great distance at which he was residing from the Chinese metropolis, he sent a letter begging that his son might be excused attendance at court, and sent back to his home. The officer Kuh Keih escorted him to his father's abode, a voluntary service which was ill requited by Che-che, who put the Chinese envoy to death. After a time, no news having been heard of Kuh Keih, inquiries were set on foot by the Chinese, when some of the Heung-noo, who had tendered their submission, said there was a rumour afloat that the whole party had been killed by the (*gow-lo*) "border guard." On the arrival of an envoy from Hoo-han-seay, he was put through a most rigorous examination in regard to the matter.

Next year the son of Hoo-han-seay Shen-yu was sent back, under the escort of the Chariot Cavalry Commandant Han Chang, and the Banqueting-house Great statesman Chang Mang, who were charged with a commission to investigate the matter of Khu Keih's party. The result was the complete exculpation of the Shen-yu, without a shade of suspicion against him. At the same time Hang and Chang observed, from the flourishing and populous condition of the Heung-noo settlement, that they had more than regained their former prosperity; and that the territory outside the stockades was no longer tenanted by the beasts of the forest and the desert. Confident in his strength, the Shen-yu was now free from apprehension in reference to Che-che; and it was rumoured that he had been strongly urged by his principal ministers to return to the north. Now it occurred to the two Chinese envoys, that should Heung-noo once remove to their northern home, there would be little chance of getting them bound by any treaty, and so took the opportunity of drawing up a solemn contract to the following effect:—"Henceforth the Chinese and Heung-noo are united as one family, and hereby bind themselves through all future generations never to deceive or attack each other. When robberies occur they will mutually sustain each other in chastising offenders, and making reparation for damages. When raids take place, they will assist each other with troops to quell disturbances. May the first to break this bond, whether Chinese or Heung-noo, be visited with the malediction of heaven! This oath

shall be binding on their children and descendants from generation to generation." For the accomplishment of the customary rights, Hang and Chang accompanied the Shen-yu and his high ministers to the top of a hill on the east of the Heung-noo No river. A white horse was then killed; a knife and some gold were deposited in the roadway and ploughed over. Wine was poured into a bowl made of the skull of the Massagetae king, who had been decapitated by Laou-shang Shen-yu; and all having drunk of it, the ceremony was thus concluded and the bond ratified. On their return, Hang and Chang reported this transaction. The dukes and high ministers, however, in deliberating over it, came to the decision that "the Shen-yu, while protecting the stockades, was a Border dependant, and even should he move north, could not be considered dangerous. Hang Chang and Chang Mang, in pledging the children and descendants of the Chinese through all future generations to an oath of imprecation with barbarous tribes, had exposed the Imperial family to shame, in the event of the Shen-yu choosing to appeal to heaven in confirmation of any nefarious statement, and had thus acted detrimentally to the dignity and character of the empire; so that the deed must not be confirmed. An envoy ought to be sent to offer a sacrifice to heaven, and have the oath repealed by mutual agreement." Hang and Chang were entrusted with this commission; but having no written statement of their offence when they arrived at the Heung-noo camp, they were silent as to any blame having been attached to them by the Emperor. They said the imperial order to them was to discuss the question of redemption of prisoners, but they did nothing towards the repeal of the oath.

In the year 43, Hoo-han-seay returned north to his palace; and his people all gradually drew together from the various quarters, so that the old country again became settled and tranquil.

Che-che Shen-yu, knowing that he had incurred the odium of the Chinese, by the murder of their envoy, and hearing of the increasing power of Hoo-han-seay, began to be apprehensive of an attack from him, and conceived the idea of removing to a greater distance. It happened about the same time that the king of Kang-ken,* who had been frequently distressed by Woo-sun, consulted with his Heih-how what was best to be done. Their conclusion was: "The Heung-noo are a great nation, to which Woo-sun was formerly subject. Now Che-che

* The ancient name of Shoghnun, or Sogdiana in Independent Tartary, inhabited by the Sacai, a wild race. It was called Kang-kwoh during the Tang dynasty, when, as well as in the Say time, the people of the country were great rovers.—Smith's "Vocabulary of Proper Names," p. 17.

Shen-yu is driven to extremities, beyond the boundaries of their land. If we make an overture to him, inviting him to locate himself on our eastern border, by uniting our troops we may take Woo-sun, and place him over it. Thus we may also be permanently delivered from the Heung-noo annoyances." In accordance with this counsel, an envoy was despatched to Keen-kwan to communicate with Che-che. The latter, who at first had feared and afterwards hated Woo-sun, heard with much satisfaction the proposal from Kang-keu. The conditions were settled without difficulty, and but a short time elapsed ere Che-che began to move westward with his forces. Kang-keu at the same time sent one of the nobles of the country to meet Che-che, with several thousand horses, asses, and camels. A great number of the Heung-noo, however, perished on the way from cold and privations, so that there was only a remnant of three thousand reached Kang-keu.

In the year 35, the Protector-General, Kan Yen-show, and the Deputy Ch'in Tang raised troops, went to Kang-keu and decapitated Che-che; the details regarding which are to be found in the memoirs of Kan Yen-show and Ch'in Tang.* The news

* The event here referred to is one of those dashing adventures that deserve a place in the annals of military fame. The fact of Che-che and his people having moved westward to Sogdiana coming to the ears of the Chinese, a deputation was sent to that country, a distance of between three and four thousand miles from the western metropolis of China, to make inquiries regarding the fate of Kuh Keih and his party. Che-che, who had become elated by his recent victories, having treated the king of Sogdiana with marked contempt, and built a fortified city for himself, now oppressed and insulted the Chinese commissioners, refusing to receive the imperial dispatch. Ch'in Tang, however, was not the man to be trifled with. Of undaunted courage and enlarged views, his mind was keen to grasp the exigencies of the position, and prepared to carry out the most daring exploit. Submitting his views to his superior officer, Kan Yen-show, he remarked: "The barbarous are easily overawed by a show of power, and readily submit to the most formidable. All the kingdoms in these regions were originally subject to the Heung-noo; and now the fame of Che-che's valorous deeds has spread far and wide. He has already invaded Woo-sun and Ta-wan, intending to subject these nations. Should he gain his point, all the kingdoms under our protectorate will be in a precarious position for many years. He is a man of great prowess, who delights in war, and presuming on his repeated victories, he has become the scourge of the west. Our plan now is to assemble the military colonists, and uniting with the troops of Woo-sun, advance direct to his city, when he will neither have the means of escape, nor be able to defend himself. Thus in one day we shall achieve a renown that will last for a thousand years." Kan Yen-show wished to memorialise the throne on the subject; but Ch'in Tang, who saw that would be fatal to his scheme, demurred. And so the matter was held in abeyance for a time. It happened, however, that Kan fell sick, and the supreme control of the military devolved on Ch'in, who made a great levy of troops among the neighbouring kingdoms, and assembled the Chinese military colonists to co-operate with them. On the recovery of Kan, he was alarmed, and would have put a stop to the movement, but Ch'in, irritated at his timidity, laying his hand on his sword, exclaimed—"The army is already collected. Boy! would you throw any obstacle in the way?" Kan ultimately assented. More than forty thousand troops were assembled, and Ch'in

of the death of Che-che proved very welcome to Hoo-han-seay. At the same time his joy was not unalloyed by a tincture of fear. In a despatch to the Emperor, he observed: "I have ever cherished the desire to announce a visit to your Sacred Majesty; but truly, while Che-che was in the west, I was apprehensive that he might unite with Woo-sun in an attack upon your servant. Thus I have always been withheld from paying court; but now that Che-che has received the due reward of his deeds, it is my humble desire to be present at an audience."

In the beginning of the year 33, the Shen-yu made his promised visit to the metropolis of China, and again had the opportunity of prostrating himself before the Emperor. The same gifts were bestowed upon him as on the first occasion, with additional favours of clothes, embroidery, silk stuffs, and raw silk, all double the amount of the additional gifts in 49. The Shen-yu then expressed his desire for an alliance with China by marriage. Yuen-te assented, and conferred on him Wang Tseang, a lady from his harem, from a family of position, with the epithet of Chaou-keun.* The Shen-yu was delighted with his acquisition, and advancing in confidence, addressed a

memorialised the throne on the subject. The same day the body began to advance, and when within thirty *le* of Che-che's city, the camp was pitched. Che-che sent a messenger to inquire what the Chinese troops had come for, to which the Commander replied: "Your highness addressed a memorial to the throne, saying that you were driven to extremities, and that you wished to be present at an audience. The emperor, compassionating your highness in having to leave your own country and take refuge in Sogdiana, has sent the Protector General with an army to meet you and guard you from surprises on the way. Before approaching your city, envoys have several times passed between us, under the protection of the Chinese. We have come a great distance on account of your highness; but you have not yet sent a prince of name, or a high dignitary to confer with our general. Why has your highness all at once thought out schemes, and neglected the rites of hospitality? Our troops have come a long way; our men and animals are prostrated; our supply of food has failed; and it is doubtful if we shall have the means of returning. We wish your highness to consult with the Great Minister." Next day they advanced upon the city, surrounded and set fire to it on all sides. When the flames burst forth simultaneously, the colonists, shouting with joy, shook the very ground with the clamour of bells and drums. The Sogdianians availed themselves of their local knowledge in attacking the assailable points, while the Chinese forces advanced in every direction under cover of their shields. The Shen-yu was mortally wounded and decapitated. The signets of two Chinese envoys were found in his habitation, besides other relics of Kuh Keih and his party.

* The novelists and dramatists of China have drawn largely on their imagination in investing the adventures of this lady with a romantic interest, the details of which are unknown to history. There is probably no heroine whose name has become more generally known in China than the unfortunate Chaou-keun. As the story runs, while crossing the Amoor river, on her way to her Tartar home, she terminated her existence by plunging into the seething waters. The sober annals of the period, on the contrary, tell us that she lived (it may be happily) with her chieftain lord till his death, and bore him a son. After that she was espoused to the son of the deceased husband, and bore him two daughters,

letter to the Emperor, proposing that the stockades on the border of the empire, from Shang-kuh westward as far as Tun-hwang, should all be placed under the protection of himself and his successors in perpetuity, and that the employment of the native troops and guards should be suspended; thus relieving the Emperor and his people from all anxiety. The proposal was handed over to the proper board for consideration, and was almost unanimously approved. The Gentleman-usher How, alone, handed in a memorandum dissenting from the project. The Emperor requesting a detailed statement of his views, he laid the following memorial, with ten objections, before the throne:—

1. The ferocities and cruelty of the Heung-noo have been notorious from the time of the Chow and the Tsin, which were harassed by their marauding border incursions; and at the accession of the Han their depredations became still more audacious. Your servant understands that outside the northern border stockades, as far as Leaou-tung, for more than a thousand *le* from east to west, runs the Yin mountain range, covered with dense forests and prolific vegetation, where birds and beasts are profusely abundant. This was the cover under which Maou-tun Shen-yu at first took shelter, to manufacture his bows and arrows, and from which he issued to make his raids. In the reign of the Emperor Woo, troops were raised to chastise the barbarians, who expelled them and took possession of that country. The Heung-noo were then driven north into the desert. Stockades were erected to mark the boundary, the roads were skirted with look-out towers, extra-mural cities were built, and military colonies were established for protection. After this there were intervals of peace on the border. The desert country on the north is level, covered with coarse sand, and very little wood or vegetation, so that when the Heung-noo came marauding, there was scarcely anything to conceal them. From the stockades southward the roads lie deep among the hills and valleys, and the passage is beset with uncommon difficulties. Men of age and

one of whom was also demanded by Wang Mang to wait upon the Empress Dowager. The tragedy is familiar to English readers, through Davis's translation, entitled "The Sorrows of Han." The topographical knowledge of the tragedian must have been very imperfect, to make the procession cross the Black Dragon or Amoor river, as the boundary between the Chinese and Heung-noo territories, in order to reach the Heung-noo capital. For the Heung-noo territory never reached north of the Amoor, and at the time in question the court was somewhere near the sources of the Selenga. There is, however, an affluent of the Yellow river, called the *Hsi-shung* or "Black water," two or three days' journey beyond the Great Wall, on the north of Shan-lee. This was probably the boundary between the two nations at the time, and may have given rise in some way to the error. Besides this and other discrepancies in the Chinese text, Davis adds several of his own in the translation.

liberality of your projects for the benefit of the people. I am wrapt in admiration of your far-sighted plan. But through every part of China there are barriers, bridges, fortresses, and stockades; so that they are not intended merely for protection against extra-mural contingencies, but are also to guard the kingdom against traitorous intrigues, and with a view to the extinction of brigandage. Thus the laws are made plain, and there is an appeal to the minds of the people." "Tell the Shen-yu respectfully," said the monarch, "that I have not the least doubt of the rectitude of his intentions; and lest he should think it strange that his proposal is not accepted, I have sent the Great Master of the Horse, the Chariot Cavalry General Kea, to communicate with him on the matter."

The reply was taken in good part by the Shen-yu, who thanked the Emperor, saying: "My dulness prevented me fully comprehending the bearings of this great policy. It was very liberal of the Emperor graciously to send your excellency to instruct me."

It was the Left E-ts'ew-tsze who first proposed to the Shen-yu the project of repairing to the boundary of China, in order to secure a state of peace. After that some one misrepresented the E-ts'ew-tsze, who had himself counteracted his merit, by his constant vacillation, till Hoo-han-seay began to suspect him. The Left E-ts'ew-tsze, fearing he might be put to death, repaired to China with his dependants, more than a thousand in all, and tendered his allegiance. He was then created Marquis of Kwan-nuy, with a revenue of three hundred houses, and instructions to wear his prince's seal and ribbon at his waist.

The same year Hoo-han-seay happened to be again paying court, together with the E-ts'ew-tsze, when the Shen-yu took occasion to thank the latter, saying: "Your highness drew out a most admirable project for me. It is to your force of character that the Heung-noo are indebted for their present peaceful condition. How can I forget your virtues! Through failing to apprehend your highness's meaning, I have been the culpable cause of your departure. But we will no longer dwell on the past; I am now about to request the Emperor that you may return to our court." The E-ts'ew-tsze replied: "Your highness, who relies on the decree of heaven, has submitted to China and obtained rest and peace. If the Shen-yu, who possesses supernatural intelligence, is protected by the Emperor, how could I be so double-minded as, having already submitted to China, to return again to the Heung-noo? Let me rather remain as your highness's resident commissioner at the court of China, for I dare not obey your commands." The

Shen-yu preferred his request, however, but without success. He then returned with Wang Chaou-keun, who was designated the Ning-hoo consort. She bare him a son, named E-too-che-ya-sze, who was made Right Jih-ch'uh Prince.

Hoo-han-seay died B.C. 31, being in the twenty-eighth year of his reign. His two favourite wives were both daughters of the Hoo-yen prince, the elder brother of the Left E-ts'ew-tsze. The elder sister, designated the Chuen-keu Consort, had two sons; the first-born named Tsu-mo-keu, and the second Nang-che-ya-sze. The younger sister, styled the Great Consort, had four sons; the first, Teaou-t'aou-mo-kaou, and the second Tsu-me-seu, both older than Tsu-mo-keu; the juniors, Heen and Lo, were both younger than Nang-che-ya-sze. There were more than ten sons by the other Consorts. The Chuen-keu Consort made much of Tsu-mo-keu, of whom she was very fond. When Hoo-han-seay was on his death-bed he wished to appoint Tsu-mo-keu his successor; but his mother objected, saying: "For more than ten years the Heung-noo have been in a state of turbulence, and within a hair of being exterminated. Thanks to the power of China, peace has been again restored; but now they are scarcely settled, and while still smarting from their wounds, are again quarrelling and fighting. My son is but young, and the people not being yet attached to him, I fear it would be again bringing the nation into danger. The Great Consort and I are both daughters of the same parents; and it were far better to appoint his senior Teaou-t'aou-mo-kaou."

To this appeal the Great Consort rejoined:—"It is true that Tsu-mo-keu is young; but then the government of the nation is in the hands of the great ministers. To set aside the noble in order to make way for the mean would be a fruitful source of turbulence in the future." The Shen-yu ultimately adopted the counsel of the Chuen-keu Consort, appointing Teaou-t'aou-mo-kaou to the succession, with the stipulation that his younger brother should in turn succeed him. On the death of Hoo-han-seay, Teaou-t'aou-mo-kaou was installed under the style of Fow-choo-luy Joe-te Shen-yu. Immediately on the assumption of power, he sent his son the Right Che-loo-urh Prince He-hee-too-noo-how as resident to the court of China. He appointed Tsu-me-seu as Left Sage Prince, Tsu-mo-keu as Left Luh-le Prince, and Nang-che-ya-sze as Right Sage Prince. He then took to wife the widowed consort Wang Chaou-keun, by whom he had two daughters, Seu-po Keu-seun-yun and Tang-yu Keu-seun-yun.

Towards the end of B.C. 28, the Shen-yu sent the Right Kaou-lin Prince E-seay-mo-yin and others with offerings, to be present at the first month's audience of the following year. On

the conclusion of the rites on that occasion, the envoy was escorted back to his temporary lodging, when he expressed his wish to become a Chinese subject, and intimated that were his proposal not accepted, nothing remained for him but to commit suicide, as he could never venture to return. When this desire was made known to the Emperor, he referred the matter for deliberation to the Dukes and High Ministers. Some of the council said his submission ought to be accepted, the same as on former occasions; but the Banqueting-house Great-statesman, Kuh Yung and Councillor Too Kin expressed their views thus:—"At the beginning of our dynasty, when the Heung-noo were committing frequent raids on the border, wealth and dignities were held out as an inducement to them to submit. Now, however, Shen-yu has stooped to declare himself a subject, and is ranked as a northern border dependant. Having sent an envoy to court with offerings, we must beware of double-dealing with him. We must adopt a different course from formerly. Having already accepted the Shen-yu's tributary offerings, should we also receive his subjects who abscond, this would be coveting the service of one man at the expense of the national honour; cherishing a guilty subject, to the loss of a well-disposed prince. Now, the Shen-yu is just beginning his reign, and having shown a desire to confide himself to China, should we, without knowing the merits of the case, accept the crafty submission of E-seay-mo-yin, to the detriment of the public good, we may alienate the Shen-yu, and demoralise the authorities at the border. It may be that he is merely adopting a deceptive stratagem, in order to generate a quarrel, and by assenting, we may fall into his plot. By countenancing the crooked, we reprobate the straightforward. This is really the source of peace or turbulence on our borders, and the principal cause to which we must attribute the activity or suspension of military operations. The subject requires careful consideration. It is undoubtedly best to decline his submission, and thus manifest an integrity unsullied as the luminaries of heaven. To repress deceitful stratagems, is to encourage a spirit of loyal attachment." This memorial was approved by the Emperor. The Inner Gentleman-usher, General Wang Shun, went to inquire the particulars about the envoy's submission; but E-seay-moy-in replied that his former perfidious statement was made under the influence of a delirious sickness. He was then sent back, and returned to the same official status as before, but would never meet the Chinese envoys.

Next year, the Shen-yu forwarded a letter expressing his desire to come to court.

In accordance with his intimation, the chief presented him-

self at the New-year audience in 25 : on which occasion he was presented with twenty thousand pieces of embroidered, figured, and variegated silk, and twenty thousand pounds of raw silk, with other objects the same as in 33.

After a reign of ten years, Fow-choo-luy Shen-yu died in B.C. 20, and was succeeded by his younger brother Tsu-me-seu as Sow-heae Jo-te Shen-yu. The first act of the new chief was to send his son the Left Chuh-too-han Prince Heu-lew-sze-how to reside at the Chinese court. He made Tsu-mo-keu Left Sage Prince, the dignity from which he himself had been promoted.

Sow-heae had been Shen-yu for eight years before he attended an audience, and it was not till the year 12 that he entered China the first time for that purpose.

Next year he again set out on a similar expedition, but before reaching the stockades he fell sick and died. Tsu-mo-keu succeeded as Keu-ya Jo-te Shen-yu, and sent his son the Yu-too-keu-tan Prince Woo-e-tang to reside at the court of China, while his brother Nang-che-ya-sze was appointed Left Sage Prince.

Keu-ya Shen-yu died in B.C. 8, being the fourth year of his reign, and was succeeded by Nang-che-ya-sze as Woo-choo-lew Jo-te Shen-yu. On assuming power he made Lo the son of the first Consort Left Sage Prince, and appointed Yu, the son of the fifth Consort, as Right Sage Prince. At the same time he sent his son, the Right Koo-noo Prince Woo-te-ya-sze to reside at the court of China. The Chinese sent the Inner Gentleman-usher General Hea-how Fan and the Deputy Master Controller Han Yung as a deputation to the Heung-noo. About this time a representation had been made to the Emperor's uncle, the Grand Master of the Horse and Light-horse General Wang Kan, who was Acting President of a Supreme board, to the following effect :—"The Heung-noo are in possession of some territory irregularly jutting out into the Chinese empire, which properly belongs to the region of Chang-yih. That land possesses a rare kind of wood peculiarly suited for the manufacture of arrow shafts, and also the falcon, the feathers of which are required for the same weapons. Were we in possession of this land, our own borders would then furnish us with these materials in abundance. If you can secure this addition to the imperial dominions, the renown of your merit will extend through all generations." When Wang Kan took occasion to speak to the Emperor regarding the advantages of this land, the monarch was for making a direct request to the Shen-yu for it. But Wang Kan, considering that, in case of refusal, the Emperor's orders would be dishonoured and his dignity compromised, merely intimated the Emperor's wishes to Hea-how Fan, leaving

it to his own tact to prefer the request. When the commission reached the Heung-noo, Hea-how Fan stated the matter in detail to the Shen-yu thus:—"I observe that the Heung-noo possessions jut out irregularly into the Chinese dominions in a place which should properly belong to the region of Chang-yih. Three Commandants reside at the stockades there, with a complement of several hundred soldiers, cold and miserable, keeping a long and wearisome look-out. It would be well for your highness to address a despatch to the Emperor, making an offering of this land; that so, by having it cut off in a straight line with the boundary, two Commandants and several hundred men may be economised—as an acknowledgment of the Emperor's bountiful favours—which will certainly call forth a rich reward." The Shen-yu inquired:—"Is this a message from the Emperor, or does the request come from your Excellency?" Hea-how Fan replied:—"The Emperor has indicated his desire; but I have taken upon myself to suggest the way in which it may be managed." The Shen-yu rejoined:—"The Emperors Seuen-te and Yuen-te, compassionating my father Hoo-han-seay, granted to the Hung-noo all the land north of the Great Wall. The land in question is the territory of the Wan-gow-too Prince, and I do not know the reason of its configuration. I beg you to allow me to send an envoy to make inquiry." Hea-how Fan returned to China, and was afterwards again sent to the Heung-noo. On his arrival, he again opened up the question of the land. The Shen-yu replied:—"It is not customary in China to ask for what has been handed down from one's ancestors for five generations. But I have ascertained the reason of your uncommon request. Having inquired of the Wan-gow-too Prince, I find that the timber used by the Heung-noo princes on the western border, for building their state tents and carriages all comes from these hills. This being our ancestral land, we must not part with it." On Hea-how Fan's return to China, he was made Governor of Tae-yuen. The Shen-yu sent an envoy with a despatch to the Emperor, giving a report of his negotiation with Hea-how Fan in reference to the land. An imperial reply was sent to the Shen-yu, saying:—"Hea-how Fan's crime is deserving of death, for having on his own responsibility made use of my authority in requesting the land from your highness. This is the second time that he has escaped through a general amnesty. I have now removed him to be Governor of Tse-nan, and he will not again be allowed to negotiate with the Heung-noo."

Next year the Shen-yu's resident son died, and the body was carried back to be buried. He then sent another son to court, the Left Yu-too-keu-tan Prince Ke-lew-kwan.

In the year B.C. 5, one of the secondary sons of the Woo-sun family, Pe-yuen-ch'e Heih-how, with his dependants, made an incursion on the Heung-noo western border, on a plundering raid, carried away their oxen and animals, and committed a great slaughter among the people. On hearing of this, the Shen-yu sent his Left Great Tang-hoo Woo-e-ling to make an attack on Woo-sun with five thousand cavalry, on which occasion they killed several hundred people, took more than a thousand captives, and drove off their oxen and animals. Pe-yuen-ch'e, being alarmed, sent his son Ts'eu-t'ae, as a hostage to the Heung-noo. The Shen-yu received him, and sent a statement of the affair to the Emperor. Consequent on this, the Inner Gentleman-usher General Ting Yay-lin and the Deputy Master Controller Kung Shing-yin were sent on a mission to reprove the Shen-yu and cause him to send back the hostage son of Pe-yuen-ch'e. The Shen-yu readily complied with their injunctions, and returned the hostage to his home.

A letter arrived from the Shen-yu in B.C. 3, expressing his wish to be present at the audience the following year. The Emperor Gae-te was at that time lying sick, and it was said, "The Heung-noo are coming from the head waters with their destructive influence. Formerly, when the Shen-yu came to court, in the years 49 and 33, both occasions were immediately followed by national calamities."* The Emperor became apprehensive, and laid the matter before the Dukes and high ministers. They also thought it a useless expenditure of the national resources, and recommended a refusal of the request. The Shen-yu's envoy having received the reply and performed the valedictory rites, had not yet taken his departure, when the Usher of the Yellow Gate, Yang Heung,† laid the following remonstrance before the throne:—
"Your servant understands that, according to the classics, the perfection of government consists in preventing insurrectionary troubles, and the highest point of military art is to avoid the occasion of war. These are two subtle points, but they form the roots of great events, and may not be disregarded. Now the Shen-yu has sent a despatch requesting to be admitted to an audience, and your Majesty has dismissed his envoy with a refusal. It is the humble opinion of your servant that this is the commencement of a quarrel between the Chinese and Heung-noo. The barbarians of the northern lands could never

* The national calamity referred to was the death of the Emperor. In 49 Seuen-te died, and 33 was the last year of Yuen-te's life. Remembering these events, the proposed visit of the Shen-yu, while the Emperor was laid aside by sickness, did not fail to arrest the attention of the observers of omens.

† See "Notes on Chinese Literature," pp. 66, 67, 69.

be brought into subjection by the Five Emperors of antiquity; nor could the Three ancient Kings bring them under the control of government, obviously because they were unwilling to induce a quarrel. But without wandering into the realms of remote ages, your servant begs, in confirmation, to refer to events since the era of the Tsin. Under the strong rule of the Emperor Che of that dynasty, the valiant Mung Teen, at the head of more than four hundred thousand warriors clad in mail, did not venture to look into Se-ho, but built the Great Wall to serve as a boundary. At the commencement of the Han, the Emperor Kaou-tsoo, with his three hundred thousand valiant spirits, were all surrounded in Ping-ching, and for seven days the troops were without food. Then there were an abundance of counsellors with strange and ingenious schemes, and ministers with unimpeachable expedients; but the means by which the captives were eventually released has never been published to the world. After that, the Empress Kaou-how was roused to anger by the Heung-noo, when a council of ministers was held in the palace, and Fan K'wae requested the command of a hundred thousand troops to scour the country of the Heung-noo. But Ke P'oo denounced Fan as deserving death; a faithful reproof of a false adviser. The great ministers then induced her to send a letter, after which the Heung-noo complication was relaxed, and the troubles of the empire were smoothed down. Again, in the time of the Emperor Wan-te, the Heung-noo made a violent aggression on the northern border, where they remained till the imperial cavalry reached Kan-tseuen in Yung. There was a great consternation in the metropolis, and three generals were put in commission to plant military colonies at Se-lew, Keih-mun, and Pa-shang, to guard against these dangers, but after a few months they were again suspended. On the accession of Woo-te, the Ma-yeh plot was concocted, to mislead the Heung-noo, and Han Gan-kwo was put in charge of three hundred thousand troops to perambulate the country and draw them into the trap. But the Heung-noo, becoming aware of the stratagem, decamped, thus rendering nugatory the great expenditure of treasure, and wear and tear of the troops. They never got sight of one of the enemy, much less the face of the Shen-yu. After that the profoundest consideration was given to the policy adapted for the permanence of the empire, and schemes for the glory of the Imperial name. A grand levy was made of several hundreds of thousands of troops, who were kept under training by Wei Tsing and Ho Keu-ping more than ten years from first to last. Crossing the West river, they cut off the Great Encampment of the Heung-noo, routed the Teen-yen station, invaded the royal palace, and reduced the country

to the greatest extremities. The fugitives were chased to the extreme north; our General made an offering at Lang-keu-seu mountain, presented a sacrifice at the Koo-yen precipice, and went as far as the Han lake. Among the captives were more than a hundred famous princes and nobles. From that time the Heung-noo became alarmed, and were more urgent for a treaty of peace; still they were not prepared to profess their subjection. What untold wealth has been gladly spent in past ages! How have innocent men been condemned to hard service, while the thoughts of the country have been extending north to the land of Lang-wang, considering that without the preliminary fatigue there can be no protracted rest—without a short time of expenditure no lasting peace is to be secured! Thus the burden of a million of troops is endured without regret, in order to avert the mouth of the hungry tiger, or a treasury of wealth is employed to fill up a gap in the Loo-k'eu mountain. About the year B.C. 73 there were some audacious Heung-noo, who determined to plunder Woo-sun and seize the Chinese princess. An army of a hundred and fifty thousand cavalry was raised, under the command of five generals, for a hunting expedition in the south, while the Marquis of Chang-lo took fifty thousand Woo-sun cavalry to overcome them on the west, till they received hostages, and then returned. The seizures on the occasion were few; it merely excited their martial prowess, and showed the energy of the Chinese troops irresistible as the wind or lightning. Although they returned empty-handed as they went, yet they killed two generals; thus the northern barbarians were taught the lesson, that if they would not submit to China, they would not be allowed peacefully to repose on a high pillow. Towards the year B.C. 60 there was an eminent display of reformation on a grand scale, and the imperial favours were abundantly diffused. But the Heung-noo were harassed by internal turbulence, there being five contending claimants for the supremacy. The Jih-ch'uh Prince Hoo-han-seay came to China, and placed himself under its civilising influences, declaring himself a subject, and submitting to its authority. Then it became a question of bridling and restraining, as occasion might demand. After this, when he wished to attend an audience he was not repelled; when he did not wish, he was not forced. Why so? Because foreigners, being of an irate and intractable disposition, and large and robust figure, they are confident in their strength, and rely on their courage. It is difficult to lead them into the path of virtue, but it is easy to stiff them up to any evil. Their stubbornness is difficult to bend; their peace is not easily secured. Hence, before they had given in their submission,

our troops were worn out by distant campaigns; the empire was desolated, its wealth was exhausted, corpses were strewn on the ground, and the soil was saturated with blood. Such is the distress incident to contest with the strong and the expulsion of enemies.

"After they are brought into subjection, they have to be soothed and appeased by intercourse and gifts; such are the necessities imposed by dignity and forbearance. Formerly we put to death the chief of the Ta-wan metropolis; we trod down the ramparts of the Woo-hwan; we examined the wall of Koo-tsang; we laid waste the arena of T'ang-tseay; we carried off the banners of Corea; and tore down the flags of the two kingdoms of Yue. The nearest of these expeditions was not over ten months' service, and the most distant occupied little short of the labours of two years. Verily we have ploughed over their palace halls, and swept away the habitations of the people, and the territories now form regions and districts of the empire. Blown away like the clouds, and rolled up like a mat, these peoples have caused no subsequent troubles. But with the barbarians of the north it is otherwise; they are in truth the formidable enemies of China. Their history from remote generations is held up for our instruction; having been treated with much consideration in past ages, they can by no means be made light of in the present. Now the Shen-yu, reverting to right feeling, and cherishing an unfeignedly sincere heart, wishes to leave his palace, and take his place at the audience before the august presence; this is a custom that has been handed down from early ages, and is favourably regarded by the spiritual intelligences. Although it may be costly to the State, it is a thing that must not be dispensed with. Why should he be repulsed as one bringing an evil influence? thus, on account of an uncertain impending event, nullifying the favours of the past, and opening up the way to a quarrel in the future. To quarrel with those who have good intentions is to gender heartfelt hatred; repudiating their former expressions, they will look to our declarations in the past, and imbibing a bitter hatred against China, will sever every connecting bond, and never more to the end will they respect the imperial presence. It will be impossible to overawe them; it will be useless to address them. What means then will be available to avert great disasters? The enlightened man sees a matter before it takes form; the intelligent man understands an affair before it is spoken about. If sincerity rules previous to the occurrence of an event, there will be no occasion to revert to the tactics of Mung Teen and Fan K'wae; nor to enact afresh the precautions of Kefh-mun and Sze-lew. What occasion

would there be for the *ruse* of Ma-yeh? where would be the use of such meritorious service as that of Wei Tsing and Ho Keu-ping? and where would be scope for the valorous deeds of the five generals? But, on the other hand, when a quarrel has once broken out, though the wisest of counsellors rack their brains in the interior, and able diplomatists crowd our streets, we shall not be able to restore the previous state of equilibrium. Formerly, in planning the government of the western regions, when a protector-general of cities and villages was located in the Keu-sze country, with thirty-six kingdoms under his rule, at an annual expense to the empire of some myriads of taels, who could have calculated that Sogdiana and Woo-sun would have crossed the white dragon mound, and made a plundering incursion on the western border? Now, in governing the Heung-noo, if the laborious efforts of a hundred years are to be lost in one day—if one is to be secured at the expense of ten—it is your servant's humble opinion that this will not tend to the peace of the country. May your Majesty reflect a little on this subject, that so calamities may be averted from the people on the borders, ere the turbulence has broken out, or war has been declared!" When this memorial was presented the Emperor was aroused to a consciousness of his position. He ordered the Heung-noo envoy to be recalled, and addressed a letter to the Shen-yu, assenting to his proposal. To Yang Heung he gave fifty pieces of silk and ten pounds weight of gold. Before the Shen-yu set out, he fell sick, and sent another envoy, expressing a desire that his audience might be deferred till next year. On former occasions, when the Shen-yu came to court, he was accompanied by princes of renown and subordinates, with attendants to the number of more than two hundred in all. The Shen-yu now forwarded a despatch, saying that in reliance on the sacred intelligence of the Emperor, whose people were numerous and strong, he wished to bring five hundred men to court with him, that they might witness the glory of the Son of Heaven. The request was granted.

In the year B.C. 1, the Shen-yu came to attend the audience; but the Emperor, finding the malign influences of the year stationed in the duodenary cycle resting on his court, removed to the Grape-vine Palace in the forest garden, and gave orders that the Shen-yu was to be treated with more than ordinary consideration. The Shen-yu acknowledged the honour, and received an additional gift of three hundred and seventy coats, thirty thousand pieces of embroidered, figured, and variegated silks, thirty thousand pounds of raw silk, with other objects, the same as in 25. At the conclusion of the rites, the Inner

Gentleman-usher, General Han Hwang, was deputed to escort the Shen-yu back. Beyond the stockades, they crossed the Keu-teen-loo river, to the north of the Heu-tun settlement. With a long return journey before them, Han Hwang's party found they were running short of provisions, and were indebted to the Shen-yu for supplying their wants. Fifty days having elapsed beyond the time that they ought to have returned, the Emperor sent Ke-lew-kwan to the Shen-yu with reference to them. On the arrival of the Ke-lew-kwan at his native land, his uterine brother, the Right Great Tseay-fang, was sent to the Chinese court with his wife instead.

On the return of the latter to the Heung-noo, the Shen-yu sent the Tseay-fang's uterine elder brother, the Left Jih-ch'uh Prince Too, with his wife, to reside at the court of China. At that time, the Emperor Ping-te being very young, the regency was retained by the Empress Dowager, while the government was in the hands of Wang Mang, the Marquis of Sin-too.

Wang Mang, who was desirous to gratify the Empress, by adopting a more dignified policy than heretofore, and by the rumours in circulation, induced the Shen-yu to send Wang Chaou-keun's daughter, Seu-po Keu-seun-yun, in A.D. 5, to wait on the Empress Dowager, thus affording an opportunity for bestowing on her most munificent gifts. Just then the king of the Ulterior Ouigours, Keu-koo, and the Keu-hoo-lae * king, T'ang-tow, becoming exasperated against the Protector General and the Master Controller, decamped with their wives, families, and subjects, and rendered their submission to the Heung-noo, the details of which are given in the "Memoirs of the Western Regions." The Shen-yu received and located them on the Left Luh-le's territory. He then sent an envoy to China with a written statement of the matter, saying, "Your servant has respectfully received them." By an imperial order, the Inner Gentlemen-ushers, Generals Han Lung and Wang Chang, the Deputy Master Controller, Chin Fow, the Imperial Attendant Reporter Pih Ch'ang, and the Chang-shwuy Master Controller, Wang Hesh, were sent on a mission to the Heung-noo. They told the Shen-yu that he ought not to have received the subjects of China from the western regions, and now it was incumbent on him to send them back. The Shen-yu replied: "The Emperors Suen-te and Yuen-te, in their compassion, agreed to a treaty, that from the Great Wall southward should be the imperial domain, while all north of the Great Wall should belong to the Shen-yu. Should there be any trespass on the

* This is the designation of the Cho [Keang, described by Phillips as "a people occupying the southern slope of the Nan-shan and the O-neou-ta-shan mountains."—Doollittle's "Vocabulary and Handbook," vol. ii. p. 207.

stockades, a statement of the matter was to be immediately forwarded, and if any deserters offered their submission, they were not to be received. Your servant is aware that his father, Hoo-han-seay, was the recipient of boundless favours, and when on his death-bed, he gave orders that if any Chinese came to propose their submission, they were to be refused, and immediately sent back to the stockades, in acknowledgment of the Emperor's great favours. But these are from outside nations, and we may receive them." The envoys rejoined: "The Heung-noo have recently been contending together with their own flesh and blood, till the nation had become almost extinct. Thanks to the great favours of China, the scattered remnants have become again united, women and children now live in tranquillity, and the family line is continued through successive generations, which abounding favour you ought to be ready to acknowledge." The Shen-yu, prostrating himself, confessed his error, and handed over the two chiefs as prisoners to the envoys. The Inner Gentleman-usher, General Wang Ming, was sent from China to receive them back at the boundary of the Go-too-noo country. The Shen-yu sent an envoy to escort them back to their own country, and begged that their offence might be pardoned. The envoy forwarded the request to court, but Wang Mang would not consent. He then assembled the various kings of the western regions, and beheaded the captives in their presence, as a warning.

After this a rescript of four prohibitory articles was issued, to the effect that Chinese absconding to the Heung-noo, Woo-sun subjects absconding to the Heung-noo, subjects of any of the kingdoms in the western regions, bearing the Chinese seal of investiture, tendering their submission to the Heung-noo, or Woo-hwan subjects tendering their submission to the Heung-noo, should none of them be received. The Inner Gentlemen-ushers, Generals Wang Seun and Wang Chang, and the Deputy Master Controllers, Chin Fow and Wang Tsin, were sent to negotiate these four articles with the Shen-yu, to whom they were presented in an ornamental case, for his future guidance. The Shen-yu accordingly returned to them the case, with the old treaty which had been ratified by Seuen-te. About the same time Wang Mang memorialised the throne, recommending that dissyllabic names should not be allowed in China; and, in furtherance of this design, sent an envoy to the Shen-yu, intimating the propriety of his forwarding a despatch to signify his submission to the civilising influence of China, in using a monosyllabic name, a declaration which would certainly be rewarded by the most liberal gifts. The Shen-yu complied with the suggestion, and stated, in a document to the throne:

"Having had the happiness to become a border dependant, your servant has unfeigned delight in complying with the sacred regulations of your peaceful administration. Your servant's name was originally Nang-che-ya-sze, which I have now respectfully changed to Che." Wang Mang was greatly pleased with this result, and told the Empress Dowager to send an envoy with a reply despatch, and very liberal gifts.

After the ratification of the four articles by Wang Mang, the Chinese Commissioner for the protection of the Woo-hwan informed these people that they were no longer to pay tribute of peltry and cloth to the Heung-noo. When the Heung-noo, as usual, sent an envoy to collect the Woo-hwan tribute, such Heung-noo men and women as were desirous of trading all followed the deputation. But the Woo-hwan kept them at a distance, saying, "We have received the articles of the imperial decree, by which we are not to pay tribute to the Heung-noo." The envoy was enraged, took the Woo-hwan chief, bound him, and suspended him head downwards. The brothers of the chief now gave vent to their fury, attacked the envoy, and put him and all his subordinates to death, while they seized the women, horses, and cattle. When the Shen-yu heard of this affair, he sent a deputation to the Woo-hwan, accompanied by the troops of the Left Sage Prince, to demand those who had put the envoy to death. When the Woo-hwan were attacked, they fled in all directions—some to the hills, and some to the protecting stockades in the east. The Heung-noo made a great slaughter among the men, and drove away a thousand of the women, the young and the feeble, whom they located in the left-hand land. They told the Woo-hwan: "You may bring horses and other animals, peltry and cloth, to redeem them." More than two thousand of the relatives of the captive Woo-hwan went with treasure and animals to redeem them. The Heung-noo received the ransom, but retained the bearers, and did not send back the captives.

In the year A.D. 9, Wang Mang, having usurped the imperial dignity under the style of the *Sin*, or "New" dynasty, sent a deputation to the Heung-noo, consisting of the Woo-wei General Wang Seun, accompanied by the leaders Chin Fow, Wang Leih, Chin Jaou, Pih Ch'ang, and Ting Nêe, with a large gift of gold and silks for the Shen-yu, and an edict informing him the decree of heaven had been received to supersede the house of Han; hence they had come to exchange the Shen-yu's seal. Now the old seal bore the inscription Heung-noo Shen-yu se, "Royal signet of the Shen-yu of the Heung-noo"; but the new seal sent by Wang Mang was changed to Sin Heung-noo Shen-yu Chang, "Official seal under the new

dynasty of the Shen-yu of the Heung-noo." On the arrival of the General, he handed the seal and badge to the Shen-yu, with the imperial order to return the old seal. The Shen-yu received the order with a double obeisance, and, before having it translated, he desired the old seal to be taken from its casket. As he took it up himself to hand it over, the Left Koo-seih How Soo, who was standing by his side, remarked, "You ought not to deliver it till you have seen the inscription on the new seal." The Shen-yu thereupon refused to deliver it. He invited the envoys to sit down in the grand tent, and wished first to invoke the blessings of longevity on the new dynasty. The Woo-wei General then said to him, "Now is the time to deliver the old seal and badge." The Shen-yu assented, and again took them up to hand them over, when the interpreter Soo again remarked, "You should not deliver it till you have seen the inscription on the new seal." But the Shen-yu replied, "Why should there be any change in the inscription?" He then opened out the old seal and badge, and presented them to the General. At the same time he formally received the new badge, but did not open it to look at the seal. They feasted till night, and on retiring from the entertainment, the right leader, Chin Jaou remarked to his colleagues, "The statesman Koo-seih How has already intimated suspicions respecting the inscription on the seal, and almost prevented the Shen-yu delivering it up. Now that he will have looked at the seal, and seen that the inscription is changed, he will certainly want the old seal back again, and we cannot talk him out of it. There could be no greater disgrace put upon the imperial order than to lose it after once having had it in our possession. The best thing to be done is to smash the old seal, in order to cut off the root of future troubles." The others hesitated doubtfully, and made no reply; but Chin Jaou, being a man of Yen, was impetuous in his movements, fetched a hatchet and broke the seal to pieces. Next day, indeed, the Shen-yu sent the Right Kuh-too How Tang to tell the General—"On the seal given to the Shen-yu by the Han dynasty was the word *Se*, 'royal signet,' and not *Chang*, 'official seal.' Neither had it the name of the dynasty, 'Han.' The seals of princes of the empire and their inferiors bear the dynastic name, and are called *Chang*, 'official seal.' On the present seal the word *Se*, 'royal signet,' is omitted, and the dynastic name *Sin* is added, precisely the same as on the seals of ministers and their inferiors. The Shen-yu wishes the old seal back." The General, showing him the old seal, said: "The new house is making laws in compliance with the dictates of heaven. We have broken up the old seal, as having simply been made at

the option of a general. Let the Shen-yu acknowledge the decree of heaven, and accept the laws of the new house." When Tang carried back an account of his interview, the Shen-yu saw that he could do nothing effectual in the matter. Moreover, being mollified by the abundant gifts he had received, he sent his younger brother, the Right Sage Prince Yu, to accompany the General back to China, with a presentation of horses and oxen, to return thanks for favours received. He took occasion also to forward a despatch, asking for a renewal of the old seal. On the General's return, when he reached the territory of the Left Le-han Prince Heen, seeing great numbers of the Woo-hwan people, he inquired of Heen about them. The latter related all the circumstances, upon which the General observed: "Formerly you received the four articles, by which it is forbidden to receive subjects from the Woo-hwan; they must be immediately sent back." Heen requested permission to communicate particularly with the Shen-yu on the subject of sending them back. The latter, in his reply to Heen, inquired if they were to be sent inside the stockades or outside. The General, unwilling to decide on his own responsibility, reported the matter to the capital, and received the order in reply, that they were to be sent to the outside of the stockades. The Shen-yu, having first been partially alienated from China by the request of land made by Hea-how Fan, the feeling was aggravated by the misunderstanding regarding the Hoo-hwan people, who had been captured in a raid, in consequence of their refusal to pay tribute; and now he had become still more enraged on account of their altering his seal. With these feelings, he sent the Right Great Tseay-keu Poo-hoo-loo-tsze, and more than ten other men of rank, with ten thousand cavalry, as it were to escort the Woo-hwan. These collected their troops outside the Suh-fang stockade, and the governor of Suh-fang reported the matter to court.

Next year the King of the Ulterior Ouigours, Seu-che-le, was planning his submission to the Heung-noo, when the Protector-General, Tan Kin, put an end to his schemes by beheading him. Seu-che-le's elder brother, Hoo-lan-che, after that collected over two thousand people, and, driving off the domestic animals, the whole nation absconded in a body, submitted to the Heung-noo, and were received by the Shen-yu. Hoo-lan-che then joined the Heung-noo in a plundering incursion and attack upon the Ouigour country, when they killed the ruler of the Ulterior metropolis, wounded the Protector-General's Master of the Horse, and returned to the Heung-noo country. At the same time the Woo-ke Master Controller's officials, Chin Leang and Tsung Tae, the Aide-de-camp Han Heuen, the

Right Keuh-how Jin Teih, and others, seeing the western regions in a state bordering on revolt, and hearing that the Heung-noo were proposing to make a grand invasion, became seriously apprehensive for their own safety. Forming a plot together, they captured by force several hundreds of the military guard, put to death the Woo-ke Master Controller Teaou Hoo, and sent messengers to the Heung-noo, who communicated with the South Le-han Prince and the South General. The Heung-noo South General entered the western regions with two thousand cavalry, where he met Chin Leang and his confederates, and, uniting their whole force, they captured more than two thousand of the Woo-kee Master-Controller's guards and people, male and female, whom they took to the Heung-noo country. Han Heuen and Jin Teih remained in the vicinity of the South General, Chin Leang and Tsung Tae passed over to the Shen-yu's palace, while the people were distributed over the cultivable lands along the banks of the Ling-woo river. The Shen-yu gave Chin Leang and Tsung Tae the title of Woo-hwan, field-marshal, and frequently invited them to his table. The Protector-General of the western regions, Tan Kin, forwarded a despatch to China, stating that the Heung-noo South General, and the Right E-ts'ew-tsze, with a large body of followers, had made a plundering attack on the kingdoms in the west. Wang Mang thereupon divided the Heung-noo into fifteen sections, to be placed under so many Shen-yus.

In the year A.D. 11, the Inner Gentleman-usher, General Lin Paou, and the Deputy Master Controller, Tae Keih, were sent with ten thousand cavalry, and a mass of rare and valuable presents, to the Yun-chung stockade, to allure the descendants of Hoo-han-seay Shen-yu. Wishing to place them all successively in office, he sent an interpreter beyond the stockade to induce the Right Le-han Prince Heen to respond to the call. Heen came with his sons, Täng and Tsou, and they were all installed in office. Heen was appointed Heaou Shen-yu, and received gifts of a private carriage, a military carriage, a thousand pounds weight of gold, a thousand pieces of various silks, and ten battle halberds. Tsou was appointed Shun Shen-yu, with a gift of five hundred pounds weight of gold. Tsou and Täng were escorted to Chang-gan. Wang Mang appointed Lin Paou as Duke of Seuen-wei, and promoted him to be Tiger's-teeth General, while Tae Keih was made Duke of Yang-wei, and promoted to be Tiger's-courage General. When the Shen-yu heard of these things, he exclaimed in rage: "My ancestor received unspeakable favours from the Emperor Seunte; but the present occupant of the imperial throne is not a descendant of Seuen-te. What right has he to be there?"

He then commissioned the Left Kuh-too Marquis, the Right E-ts'ew-tsze Prince Hoo-loo-tsze, and the Left Sage Prince Lo, who entered the Yih-show stockade in Yun-chung with troops, and made a great slaughter among the guards and people. After that, at various times, he encouraged the Right and Left Divisional Commandants, and the Border Land Princes to enter the stockades on plundering raids. The largest of the bands consisted of more than ten thousand, those of secondary importance numbered several thousands, while there were smaller bands of only a few hundreds. They killed the Governors and Commandants of Yen-mun and Suh-fang, and carried off the guards, people, and animals innumerable, till the borders became utterly abandoned. Wang Mang, having but recently assumed the imperial authority, sought to impart a dignity to his reign, in reliance on the wealth of the treasury. He appointed twelve Divisional Leaders, made a levy of the most courageous troops from the different kingdoms, and picked soldiers from the military depôts, which were placed in military colonies, to be drafted off to the border. The intention was to collect an army of three hundred thousand, and having prepared provisions for three hundred days, to issue simultaneously by ten different roads, and pursue the Heung-noo to the last extremities, till they were driven back upon the Ting-ling, and then divide the land among fifteen of the descendants of Hoo-han-seay. At this juncture Wang Mang's General, Yen Yew, laid the following remonstrance before the throne: "Your servant has learnt that the Heung-noo are a trouble of very old standing, but he has not heard that it was thought necessary, in remote ages, to send troops against them. In later times the Chow, Tsin, and Han undertook to subdue them, but their policy was not of the highest order. The Chow acted on a second-rate policy, the Han was guided by a policy of the lowest kind, and the Tsin cannot be said to have had any policy at all. In the time of Seu-en-wang of the Chow, the Hen-yun invaded the inner land as far as King-yang;* but a General having been commissioned to subjugate them, he succeeded in completely expelling them from the country. An invasion by the barbarians from the north or west may be compared to the pest of mosquitoes, which can only be driven away. Hence the empire got a reputation for intelligence; and this was a policy of a medium character. Woo-te of the Han selected his generals and trained troops, made preparation of light provisions, and penetrated far in among the distant barbarian tribes. Although merit was obtained by conquest

* A district in the present prefecture of So-gan in Shen-se province, the city being in N. lat. 34° 30', E. long. 108° 45'.

and capture, the Hoo immediately retaliated, and for more than thirty years there was a continuous-succession of military calamities. The resources of China were reduced, and the Heung-noo were cut down. The empire attained a military reputation; but this was the lowest order of policy. The Emperor Che of the Tsin could not bear disgrace, and, lightly using up the strength of the people, built the Great Wall for security, extending a distance of ten thousand *le*. He also opened up ways for the transport of taxes, from the sea-coast to the uttermost extremities of the land. When the work was completed, China was exhausted within, and the spirits of the land and grain were neglected. This could not be considered a policy at all. Now the empire is on the verge of the *Male nine** tribulation, and approaching a year of famine, which will be still more severe for the north-western border. To make a levy of three hundred thousand troops, with provisions for three hundred days—if the ocean and Tae-shan mountain may be brought from the east, and the Keang and Hwae rivers be collected from the south, then, indeed, adequate provision may be made. If we reckon the distance of the way, a year will not be sufficient to effect the gathering. The soldiers who are first on the ground, being brought into close quarters, disturbances will break out. Some of the troops being old, and the weapons worn out, will both be unfit for use; which is the first difficulty.

"The borders being now deserted, no provisions for the army can be procured thence, and there is no mutual interdependence between the various regions and states, by which the wants of the one may be supplied from the fulness of the other; which is the second difficulty.

"If we reckon the consumption per man for three hundred days at eighteen bushels of dried rice, such a weight will require oxen for the transport; and then the food for the oxen must also be provided, which will be an additional weight of twenty bushels. The Hoo land is for the most part sandy and salt, with scarcity of water and herbage, as we know from past experience; and before the army has been out a hundred days the oxen will all die out, while the quantity of provisions still left will be more than the men can carry; which is the third difficulty.

"The Hoo country is very cold in the autumn and winter, and exposed to high winds in the spring and summer, which would necessitate a vast amount of pots and boilers, firewood and charcoal—a weight that would be utterly unmanageable. There would be a want of dried food, and water to drink, and

* An allusion to the occult doctrine of the numbers in the *Tih-king*. The period of the memorial was the eighth year of the sexagenary cycle.

the cares consequent on sickness and epidemics among the troops. On this account, the Hoo of past ages, with every precaution to preserve their strength, were obliged to succumb within a hundred days; which is the fourth difficulty.

"The baggage waggons that accompany the army are rarely light and springy, and cannot go with rapidity. Captives might escape very leisurely, and we should not be able to overtake them. If we had the good fortune to meet with captives, and tied them to the baggage waggons, there are dangerous and precipitous places on the road, where horses must follow each other in single line, and the prisoners would have to be detached before or behind, which would be incalculably hazardous; and that is the fifth difficulty.

"In thus extensively using up the strength of the people, there will be no opportunity for signalling their merit. Your servant would humbly express his concern about the matter. But now, since the troops have been raised, let those who first arrive be sent off. Let your servant and others proceed far into the country, come down upon them with an overwhelming onset, and thus effectually chastise the Hoo."

Wang Mang would not listen to Yen Yew's remonstrance, but continued to furnish grain to the troops as before, which gave rise to a great commotion through the empire. When Heen had received the title of Heaou Shen-yu from Wang Mang, he galloped off beyond the stockades, returned to the palace of the Shen-yu, and related the whole affair to him. The Shen-yu thereupon appointed him to the petty Heung-noo dignity of Marquis of Yu-suh-che-che. After that Tsou fell sick and died, when Wang Mang appointed Täng to succeed him as Shun Shen-yu. The Distress Removing General, Chin Kin, and the Barbarian Daunting General, Wang Seun, established a military colony at Kō-seay stockade in Yun-chung. About the same time the Heung-noo made several raids on the border, killed the general and guards, took captive the people, and drove off great numbers of their animals. The captives who had been taken by the Chinese were questioned regarding these movements, and all affirmed that it was Kēu, the son of the Heaou Shen-yu Heen, who had been the leader in the raids. The two Generals reported the same to the court.

In the spring of the year 12, Wang Mang assembled all the barbarians in the capital, and in their presence beheaded Tang, the son of Heen, publicly in the market-place. From the time of Seuen-te, for several generations, the country had not been startled by beacon fires on the northern borders, the dwellings of the people were numerous, and horses and oxen were scattered over the country. But when Wang Mang excited

turbulence among the Heung-noo, and got involved in difficulties with them, the people were reduced by death, and carried off into captivity. The troops of the twelve divisions having been long settled in their colonies without being called out, and the guards being suspended or worn out, for several years the border lands had been an abandoned desert, covered only by bleached bones.

Towards the end of A.D. 13, Woo-choo-lew Shen-yu died, in the twenty-first year of his reign. The great minister of the Heung-noo legislature, the Right Kuh-too Marquis, Sen-po Tang, the husband of Wang Chaou-keun's daughter, E-mih Keu-seun-yun, was desirous of cementing a peace with China; and having been on very intimate terms with Heen, observing the honours put upon him from first to last by Wang Mang, he passed over Yu, and set up Heen as Woo-luy Jō-te Shen-yu. On the accession of Heen, he made his younger brother Yu the Left Luh-le Prince. Woo-chow-lew Shen-yu's son, Soo-too-hoo, was originally Left Sage Prince, while the same monarch appointed his own younger brother, Loo-hwan, son of the Tōo-ke consort, as Right Sage Prince. During the lifetime of Woo-chow-lew, several successive Left Sage princes had died; when, considering the title an infelicitous one, he commanded it to be altered to that of Hoo-yu. The title Hoo-yu indicated the most honourable rank, such as entitled the bearer to succeed to the dignity of Shen-yu. Hence Woo-choo-lew Shen-yu gave it to his eldest son, implying that he was heir-apparent. But Heen having been incensed against Woo-choo-lew Shen-yu, for having degraded his own title, was unwilling that the dignity should pass to Soo-too-hoo, and degraded him to the rank of Left Tōo-ke Prince. Yun Tang then urged Heen to get a treaty of peace with China.

In the year 14 Yun Tang sent people to the Che-loo stockade at Hoo-mang, on the *Se-ho*, or "West River," who informed the officer at the stockade that they wished to see the Ho-tsin Marquis. Wang Heih, the Ho-tsin Marquis, was the son of Wang Chaou-keun's brother. The Middle Division Commandant reported the matter to the court. Wang Mang then sent Wang Heih and his younger brother, the Cavalry Commandant Marquis of Chen-tih Sa, on a mission to the Heung-noo, to make congratulatory presents on occasion of the new Shen-yu's accession, consisting of gold, clothing, and silk stuffs. They mendaciously told the Shen-yu that his resident son Tang was still alive, and on the strength of that tried to induce him to give up Chin Leang, Tsung Tae, and the others. The Shen-yu in consequence took these four men, and the villain Che Yun, who had killed the Master Controller, Teau Hoo,

with his own hand, with their wives, children, and subordinates, twenty-seven persons in all, whom he put in fetters and delivered to the envoys. Wang Heih and Wang Sa were escorted by the Choo-wei Koo-seih, Prince Foo, and others, to the number of forty persons. Wang Mang then introduced the bonfire punishment, by which Chin Leang and the others were put to death. He then suspended the general leaders and the military colony troops, and appointed ambulating guard commandants. The Shen-yu coveted Wang Mang's gifts, and hence he conformed outwardly to the old Chinese institutions; but secretly he profited by the raids and seizures. On the return of his envoys, becoming aware that his son Tang had been formally put to death, he was filled with rage and hatred, and the raids and captures were carried on unceasingly from the left-hand land. The envoys heard the Shen-yu invariably stating: "The Woo-hwan have combined with some disreputable Heung-noo people to carry out raids on the stockades, just the same as the thieves and robbers in China. When I first acceded to the supreme power, I found the national dignity and good faith at a low ebb, and have exerted all my strength in trying to put a stop to the disorders, not daring to act with duplicity."

In the fifth month of the year 15 Wang Mang again sent Wang Heih and the Woo-wei General Wang Keen, with the leaders Fuh Gan, Ting Nee, and others, six in all, to escort the Right Choo-wei Koo-seih Prince. On that occasion the bodies of the resident Prince Tang and the nobles of his suite, who had been decapitated, were conveyed to the stockade in common carriages, where the Shen-yu sent Yun Tang's son, the Baron and Great Tseay-ken Chay, and others, to meet them. When Wang Heen arrived with his party, he made great presents of gold and valuables to the Shen-yu, and in virtue of an imperial edict, changed the designation *Heung-noo*, or "Savage slaves," to *Kung-noo*, or "Respectful slaves," and the title *Shen-yu*, or "The Single one," to *Shen-yu*, or "The Good one." A new seal and badge was conferred on him; the Kuh-too Marquis Tang was created Duke of How-gan, and Tang's son, the Baron Chay, was made Marquis of How-gan. The Shen-yu, who coveted Wang Mang's gold and silks, gave a deceitful compliance with these proceedings, but at the same time continued his raids and robberies as before. Wang Heen and Wang Heih gave to Yun Tang the money stipulated for delivering up Chin Leang and the others, to convey to the Shen-yu. In the twelfth month they returned within the stockade, when Wang Mang was greatly delighted, and conferred on Wang Heih two millions cash, while Fuh-gan and the others were all promoted.

In A.D. 18, the Shen-yu Heen died, in the fifth year of his reign, and was succeeded by his younger brother, the Left Sage Prince Yu, under the style of Hoo-too-urh-she Taou-kao Jō-te Shen-yu. *Jō-te*, in the Heung-noo language, is the equivalent of the Chinese *Heou*, or "Filial." Since the time of Hoo-han-seay, the Heung-noo having been in intimate alliance with China, they observed that the Chinese used the word *Heou* in the imperial title, and wishing to imitate the custom, inserted the word *Jō-te* in the title of every Shen-yu. As soon as Hoo-too-urh-she Shen-yu Yu had assumed power, his covetous desire for the imperial gifts was manifest. He sent the Great Tseay-keu Chay, with the Prince of He-tuh Keu, the son of Tang-hoo Keu-seun, the junior of the Yun sisters, to present offerings at court. When the mission was about to return, Wang Mang sent Wang Heih, the Marquis of Ho-tsin, to accompany Chay's party. On their arrival at the Che-loo stockade, they were met by Yun Tang, who was then compelled by the military to go to Chang-gan. Yun Tang's youngest son, the Baron, made his escape when outside the stockade, and returned to the Heung-noo.

Arrived at Chang-gan, Yun Tang was promoted by Wang Mang, in A.D. 19, to the dignity of Sen-po Shen-yu, the usurper's intention being to send a large army to instal him and support his claim; but the troops could not be got to act in concert, while the Heung-noo became still more irritated, and made simultaneous incursions on the northern borders. The consequence was that the northern borders were utterly desolated. Yun Tang fell sick and died. Wang Mang gave his junior daughter Luh-luh in marriage to Chay, the Duke of How-gau, an extreme mark of the most honourable favour; and eventually he wished, by military power, to establish him as the Shen-yu. In 22, Wang Mang was put to death by the Chinese troops, and Yun Chay died soon after.

In the winter of 24, the Chinese sent the Inner Gentleman-usher, General Wang Sa, the Marquis of Kwei-tih, and the Grand Master of the Horse and Military Protector, Chin Tsun, on a mission to the Heung-noo, to restore to the Shen-yu the original seal and badge of the Han, and also the seals and badges of the princes, marquises, and subordinates. On the same occasion they escorted back the surviving relatives, dependants, and suite, of Yun Tang. But the Shen-yu Yu haughtily remarked to Wang Sa and Chin Tsun: "Originally the Chinese and Heung-noo were as brethren, but when internal disturbances arose among the Heung-noo, the Emperor Seuen-te assisted in establishing Hoo-han-seay Shen-yu. Hence, in order to give due honour to China, he declared his submission as a

subject. But now a state of anarchy has taken place in China, Wang Mang having usurped the supreme power, when the Heung-noo also sent troops to attack him, and have devastated his border land, causing a great consternation throughout the empire. The thoughts of the people have reverted to the Han, Wang Mang has been killed, his cause overthrown, and thus through our means the Han has been re-established. Now we ought to be treated with greater honours." Chin Tsun reasoned the matter, but the Shen-yu maintained his position to the end. On returning to Chang-gan in the summer of 25, the envoys found Kang-che* had been defeated, and the Red eyebrow insurgents were in possession.

REFLECTIONS ON THE ABOVE MEMOIR.†

The *Shoo king* contains a warning regarding "the barbarous tribes who disturb our bright great land."‡ The *She king* speaks of "dealing with the tribes of the west and north."§ The *Ch'un ts'ew* signifies that the roads had been long held against the barbarians. These allusions all point to the miseries inflicted by the barbarian hordes. Hence, from the accession of the Han, every loyal and talented minister has had a scheme to propose, as is evidenced, by the thick-set mementoes in the Confucian temple. In the reign of Kaou-tsoo, there was Lew King; in the time of the Empress Lew-how, there were Fan K'wae and Ke Poo; during the reign of Heaou Wän-te, there were Kea E and Chaou Ts'o; in the reign of Heaou Woo-te, there were Wang K'wei, Han Gan-kwö, Choo Mae-shin, Kung-sun Hung, and Tung Chung-shoo;—all holding their individual views, differing more or less from each other. But they may all be referred to two categories: literary men of the gentry class hold to the idea of peace and amity, while members of the warrior class always talk of invasion. Both these are partial in their views, merely looking to the exigencies of the moment, and not taking into account the whole history of the Heung-noo. From the commencement of the Han dynasty to the present time, the flight of generations and the lapse of years exceed those of the period of the *Ch'un-ts'ew* classic. Sometimes the Heung-noo have been treated with urbanity, according

* After the death of Wang Mang a Chinese general, named Lew Heuen, was placed on the throne, with the epithet Kang-che (*Inceptor de novo*), but he retained the position little more than a year.

† Down to the year B.C. 97, the preceding memoir seems to have been copied from the *Shi-ke*, the work of Sze-ma Tseen. The subsequent portion is probably compiled from contemporary State documents. The section that now follows is the composition of Pan Koo, the author of the *Han-shoo*, and gives his own views on what precedes.

‡ See Legge's "Chinese Classics," vol. iii. Pt. 1, p. 44.

§ *Ibid.*, vol. iv. Pt. 2, p. 626.

to the bonds of peace and amity; sometimes they have been subdued and kept under with the severity of martial rigour. Sometimes they have humbly accepted positions in the imperial service; sometimes they have been awed into subjection, and sustained as subjects. They have been exposed to the changes of contraction and expansion; they have experienced the reverses of strength and debility; so that we are now in a position to speak of their circumstances in detail.

The earliest proposal of a treaty of peace was made by Lew King. At that time the empire had recently recovered from its disasters, when fresh troubles supervened in the affair of Ping-ching. Hence his advice was followed, a treaty of peace was ratified, and gifts were presented to the Shen-yu, in the hope of securing tranquillity in the border lands. In the time of Heaou Hwuy-te and Kaou-how, the same policy was followed up without intermission; still the Heung-noo raids and robberies did not cease or diminish, and the Shen-yu, on the contrary, became still more arrogant. Heaou Wän-te opened markets for them at the barriers, gave a Chinese princess in marriage to the Shen-yu, and increased the gifts by a thousand taels per annum. Yet the Heung-noo often broke the treaty, and the border lands were frequently devastated by them. Hence, in the middle of his reign, Wän-te, startled from his repose, roused his energy, and went forth in person to the subjugation of the barbarians. Mounting his horse, and accompanied by strong and able troops, selected from the best families throughout six regions, he practised equestrian archery in the neighbouring forest, and discoursed on keeping up the military training. He collected the choicest troops throughout the empire, formed an army at Kwang-woo, and made inquiries of Fung T'ang. While talking together about the General Commanders, he heaved a heavy sigh as he thought of the ancient famous ministers. Here, then, we see the clearest evidence of the inefficacy of treaties of peace. Tung Chung-shoo, with the experience of four generations, still wished to adhere to the ancient policy, and rather to strengthen the bond. He said: "The superior man is influenced by right principles, but the covetous man is moved by the desire of gain. As for the Heung-noo, it is useless to talk to them about benevolence and right feeling; speak to them of large gains, as the only means by which they can be bound in the sight of heaven. Therefore give them great gains to annihilate their opinions; form a contract in the sight of heaven, in order to strengthen the bond, and take their beloved sons as hostages, in order to have a control of their hearts. Although the Heung-noo are changeable and restless, yet they will never forego heavy gains; they

will not deceive high heaven; they will not kill their beloved sons. Now, to collect taxes and send presents is much less expensive than maintaining the threefold army; the ramparts of a city are not a greater security than an honest man's bond. And will it not be a great blessing to the country when, among the people of the border cities that defend the boundaries, the adults can move about free from apprehension and care, while the children are quietly nourished by their mothers; when no outlandish horsemen are prowling about the walls, and when no urgent despatches are flying through the empire?"

Let us look at Tung Chung-choo's proposals. If we examine their operation, we find they do not meet the exigencies of the time being, and are manifestly insufficient in view of the future. In the time of Heaou Woo-te, although they were invaded and attacked, defeated and captured, yet the loss of men and horses on both sides was about equal. Although the open country south of the Yellow River was cleared, and the Suh-fang region settled, yet more than nine hundred *le* north of Tsaou-yang was abandoned. Whenever any of the Heung-noo people came to tender their submission to China, the Shen-yu immediately retaliated by retaining the Chinese envoys. Such being their fierce and intractable spirit, was it likely they would send their beloved sons as hostages? Thus we see, then, that these proposals do not meet the exigencies of the time being. If hostages are not given, then treaties of peace are but empty forms. Witness the sad experience of Heaou Wán-te in the past, when the deceitfulness of the Heung-noo was ever becoming aggravated. Now, if functionaries are not selected for the border cities, to preserve the boundaries, and superintend military operations; to repair roads and embankments; to provide requisites for the stockades; to keep the halberds and cross-bows in efficient order, that so we may rely on our own resources in dealing with the border bandits;—but if, on the contrary, we make a point of raising taxes among the people, to send valuable presents to distant lands; if we flay and oppress the citizens of the empire, in order to make offerings to plundering enemies, believing in fair words while we hold an empty treaty;—how, then, shall we prevent outlandish horsemen incessantly prowling about? When Heaou Seu-en-te came into power, the Heung-noo were kept within bounds by the valorous prestige of Woo-te's impetuous attacks. In the course of a century they had become reduced almost to extinction by internal strife, when, by the judicious application of the power we had attained, they were overawed by the imperial dignity. After this the Shen-yu, prostrating himself before the throne, tendered his submission as a subject, and sent his son as a hostage. For three generations they held the position

of border dependants, and were received as guests at the Chinese court. At that time the border cities were closed in peace, and the cattle and horses were scattered over the plains. For three generations the inhabitants were not alarmed by the barking of dogs, and the people had become unused to military weapons. But about sixty years after this Wang Mang usurped the throne, and there was a commencement of border quarrels. From that occasion the anger of the Shen-yu was excited, and he cut off his connection with the empire. Wang Mang then decapitated his son, the hostage, and the border calamities supervened. Hence, when Hoo-han-seay first paid court to China, while the Chinese were deliberating about the etiquette, Seaou Wang-che said: "When the barbarians from the north and west inhabiting the wild domains say they have come to tender their submission, it is but a spasmodic and unreliable movement, coming and going without rule; they should be treated with the etiquette due to guests, yielding complacently, but not acknowledging them as subjects; then should they at a future time abscond and conceal themselves, if in China they will not be considered rebellious subjects."

In the time of Heaou Yuen-te, the question was discussed of suspending the guard for the defence of the stockades, when How Ying gave a decided negative to the proposal. This illustrates the principle that in the time of prosperity we must not overlook the possibility of decay; in the time of peace we must think of impending danger, and get an intelligent perception of minute causes while the consequences are still in the distant future. As to the Shen-yu Heen, he abandoned his beloved son, and, blinded by avarice, he overlooked the many myriads of booty obtained by invasion and capture, while the gifts consequent on a treaty did not exceed a thousand taels. Where, then, is the doctrine that they will not abandon their hostages, nor relinquish heavy gains? This is the weak point in Tung Chung-shoo's reasoning.

Now, in deliberating on the course of events, if we do not take into account the security of all coming generations, and blindly rest only upon the existing aspect of affairs, such a policy is not calculated to endure. As to the merit of invasion and defeat, referring to the transactions of the Tsin and Han dynasties, the words of Yen Yew are much to the point:—"Therefore the former kings, in measuring out the land, put the imperial territory in the centre; they divided the country into nine departments; they arranged the five outside tenures, and appointed the tribute of stock and soil; they established laws for the inner and outer nations, penal administration was fixed, and civilising influences diffused, applicable respectively to the nearer or more remote regions. Thus, according to the

Ch'un ts'ew classic, inside was the Chinese empire and outside were the barbarous nations. The barbarians are covetous and greedy of gain; their hair hangs down over their bodies, and their coats are buttoned on the left side.* They have human faces, but the hearts of beasts; they are distinguished from the natives of the empire both by their manners and their dress; they differ both in their customs and their food, and in language they are mutually unintelligible. They live retired among the northern hills and the secluded deserts, leading their flocks wherever pasture is to be found. Hunting is the business of their life. Divided from each other by the hills and valleys, and isolated by the sandy desert, nature has placed a geographical separation between the inner and outer nations. On this account the ancient sage kings treated them like birds and beasts; they did not contract treaties, nor did they attack them. To form a treaty is simply to spend treasure and be deceived; to attack them is merely to weary out the troops and provoke raids. Their country cannot be cultivated for food; their people cannot be encouraged as subjects. Thus the outer are not to be brought inside; they must be held at a distance, avoiding familiarity. Administrative instruction will not affect these people, the New-year's audience will not be attended by these nations. When they come, they are to be restrained and controlled; when they go, precautions and defence must be attended to. If they show a leaning towards right principles, and present tributary offerings, they should be treated with a yielding etiquette, but bridling and repressing must never be relaxed, ever conforming to circumstances. Such was the constant principle of the sage monarchs in ruling and controlling the barbarian tribes."

MARCH 9TH, 1875.

SPECIAL GENERAL MEETING.

(At Seven o'clock.)

Colonel A. LANE FOX, *President, in the Chair.*

The Director read the circular convening the meeting as follows:—

Anthropological Institute of Great Britain and Ireland,

4, St. Martin's Place, W.C., Feb. 23rd, 1875.

SIR,—I have to inform you that a General Meeting of the Members of the Institute will be held here on the 9th of March,

* The coats of the Chinese are always buttoned on the right side.

at Seven o'clock p.m. precisely (previous to the Ordinary Meeting of that evening), for the following purposes:—

"1. To consider, and if deemed advisable to authorise, an application to the Board of Trade for a license to the Institute, under s. 23 of the Companies' Act, 1867.

"2. To consider, and if deemed advisable to adopt, the Draft Memorandum and Articles of Association prepared for the incorporation of the Institute, under that Act, subject to any modification the Council to the Board of Trade may advise.

"3. To consider, and if deemed advisable to adopt, a new Regulation or Article, defining that words used in the Regulations or Articles importing the masculine gender shall include the feminine, and words importing the singular number, the plural; and that where any office of the Institute is filled by more than one person, any of the duties of such office may be performed by either of such persons."

The Members are desired to observe that the above proposition involves the admission of Ladies as Members of the Institute. In the event of their adopting it, it will be proposed to provide also, that the Council may declare any Meeting of the Institute open to male Members only.—I am, Sir, yours faithfully,

E. W. BRABROOK, *Director*.

Mr. F. G. H. PRICE moved, and Mr. J. CAMPBELL, R.N., seconded, the following resolution:—"That Ladies be admitted as Members of the Institute." After a prolonged discussion, the motion was carried by a majority of six votes.

Professor HUGHES moved, and Mr. CHARLESWORTH seconded, the resolution, "That no distinction be made between the memberships of the sexes." Carried by a majority of twelve votes.

On the motion of Mr. BRABROOK, seconded by Sir DUNCAN GIBB, the resolutions relating to the Articles of Association were carried unanimously.

ORDINARY MEETING.

(At Eight o'clock.)

Colonel A. LANE FOX, *President, in the Chair*.

The minutes of the last Ordinary Meeting were read and confirmed.

The following new members were announced:—The Hon. Sir ARTHUR H. GORDON, Governor of Fiji; BERTRAM F. HARTSHORNE, Esq., Iver, Uxbridge; and C. CZARNIKOW, Esq., Mitcham.

The following list of presents was read, and the thanks of the meeting were voted to the respective donors thereof:—

FOR THE LIBRARY.

From the EDITOR.—*Revue Scientifique*. Nos. 33, 34, 35, and 36, 1875.

From the EDITOR.—*Nature* (to date).

From the REGISTRAR-GENERAL of New Zealand.—Statistics of the Colony of New Zealand for 1873.

From the ASSOCIATION.—Journal of the East India Association.

From the SOCIETY.—Proceedings of the Royal Society. Vol. XXIII. No. 158.

From the SOCIETY.—Journal of the Royal Geological Society of Ireland. Vol. XIV. Part 1.

From JAMES BURNS, Esq.—Human Nature, Nos. 88, 93, 94, and 95.

From the EDITOR.—Materiaux pour l'Histoire Primitive et Naturelle de l'Homme. Vol. V. No. 10.

From the SOCIETY.—Journal of the Asiatic Society of Bengal. Parts 1 and 2, No. 3.

From the ASSOCIATION.—Proceedings of the Geologists' Association. Vol. IV. No. 1.

From the SOCIETY.—Proceedings of the Liverpool Literary and Philosophical Society. Vol. XXVIII.

The following paper was read by the author :

ULTRA-CENTENARIAN LONGEVITY. By Sir G. DUNCAN GIBB, Bart., M.A., M.D., LL.D., Physician to Westminster Hospital.

It has been my good fortune to bring before the notice of the British Association at Edinburgh, in 1871, and at Bradford, in 1873, nine examples in which I had examined persons who had attained the golden age of one hundred years,* who furnished information of the highest physiological and social interest. As doubts have been thrown of late years upon the actual possibility, or, at least, probability of reaching to such a great age, special care was taken to ascertain the correctness of the date of the births of the persons submitted to the notice of the Association, so that their value could not be called in question. If that were necessary for centenarians who had overstepped the century by from two to four years, it became doubly so in an instance now to be brought forward, where the truly exceptional age of 111 years was reached. At first sight this might seem to be extraordinary, but to show that it is not so, my excellent friend, Mr. Henry Rance, of Cambridge, has furnished me with some tables, which he has been at great pains to compile, in which even that age is shown to be by no means uncommon, and has been occasionally exceeded. If these tables are analysed, we find they represent eighty-four examples of persons who have lived to reach an age between 107 and 175. These, again, are divided into three series, and form three distinct tables—Nos. 1, 2, and 3.

* See also "Journal of Anthropological Institute" for April, 1872, and *Medical Times* of 20th June, 1874.

ULTRA-CENTENARIAN LONGEVITY.

TABLE I.—INSTANCES SELECTED FROM VARIOUS SOURCES PRIOR TO 1800.

| YEAR. | NAME. | AGE. | YEAR. | NAME. | AGE. |
|-------|------------------------|------|-------|---------------------------|------|
| 1759 | Don Cameron | 130 | 1772 | Mrs. Clum | 138 |
| 1766 | Jno. Deinsomer | 130 | 1766 | Thomas Dobson | 139 |
| 1766 | George King | 130 | 1785 | Mary Cameron | 139 |
| 1767 | John Taylor | 130 | 1732* | William Leyland | 140 |
| 1774 | William Beattie | 130 | | Countess of Desmond | 140 |
| 1778 | John Watson | 130 | 1770 | James Jands | 140 |
| 1780 | Robert M'Bride | 130 | 1778 | Swarling (a monk) | 142 |
| 1780 | William Ellis | 130 | 1773 | Chas. M'Finlay | 143 |
| 1764 | Eliza Taylor | 131 | 1757 | John Edingham | 144 |
| 1775 | Peter Garden | 131 | 1782 | Evan Williams | 145 |
| 1761 | Eliza Merchant | 133 | 1766 | Thomas Winsloe | 146 |
| 1772 | Mrs. Keith | 133 | 1772 | J. C. Drakenberg | 146 |
| 1767 | Francis Ange | 134 | 1652 | William Mead | 148 |
| 1777 | John Brookey | 134 | 1768 | Francis Confi | 150 |
| 1714 | Jane Harrison | 135 | 1542 | Thomas Newman | 152 |
| 1759 | James Sheile | 136 | 1656 | James Bowels | 152 |
| 1768 | Catherine Neon | 136 | | Henry West | 152 |
| 1771 | Margaret Foster | 136 | 1648 | Thomas Damme | 149 |
| 1776 | John Mariat | 136 | 1670 | Henry Jenkins | 169 |
| 1772 | J. Richardson | 137 | 1635 | Thomas Parr | 152 |
| 1793 | — Robertson | 137 | 1762 | A Polish peasant | 157 |
| 1757 | William Sharpley | 138 | 1797 | Joseph Sarrington | 160 |
| 1768 | J. M'Donough | 138 | 1668 | William Edwards | 163 |
| 1770 | — Fairbrother | 138 | 1780 | Louisa Truxo | 175 |

TABLE II.—PERSONS WHO HAVE DIED OF LATE YEARS.

| YEAR. | NAME. | AGE. | YEAR. | NAME. | AGE. |
|-------|------------------------------------|------|-------|-------------------------------------|------|
| 1821 | Cato Overing (a Black) | 110 | 1823 | A woman in Finland | 115 |
| 1823 | Ellen Tate | 110 | 1818 | Ann Smallwood | 116 |
| 1823 | Mrs. Ormsby | 110 | | Alex. Campbell | 117 |
| 1823 | Mr. J. Larling * | 110 | 1822 | A female slave (Jamaica) | 120 |
| 1808 | Col. J. Stewart | 111 | 1822 | T. Gilbert | 120 |
| 1820 | Bridget Byrne | 111 | 1822 | J. Woods | 122 |
| 1822 | Joseph Mills | 111 | 1818 | David Ferguson | 124 |
| 1823 | J. Mackenzie | 111 | 1822 | Thady Doorley † | |
| 1821 | Ann M'Rae | 112 | 1821 | Marg. Darby (a Black) | 130 |
| 1822 | Samuel Welch (an American) † | 112 | 1822 | Lucretia Stewart | 130 |
| 1818 | Thomas Botwell | 113 | 1819 | Roger Hope Elliston (a Negro) | 140 |
| | William Napier | 113 | 1820 | Solomon Nibet | 143 |

* He left 130 children and grandchildren.

† His father was near 90, his mother 100, a sister 100, and brother upwards of 90.

‡ This person was married, when 107 years of age, to a woman aged 31.

TABLE III.—PERSONS LIVING IN THE SEVERAL YEARS SET AGAINST THEIR RESPECTIVE NAMES.

| YEAR. | NAME. | AGE. | YEAR. | NAME. | AGE. |
|-------|---|------|-------|--|------|
| 1821 | A widow, named Miller, at Lynn | 107 | 1822 | Felix Buckley, Esq. ... | 113 |
| 1823 | John Macdonald | 108 | 1818 | At Charleston, a Negro | 118 |
| 1818 | John Dorman, Stra- bane, Ireland | 109 | 1823 | A female in Calabria... | 125 |
| 1820 | At Adria, in Lombardy, a Catholic priest ... | 110 | 1819 | Henry Francisco (an American) | 130 |
| 1823 | Peter Grant (a High- lander) | 110 | 1819 | At Lake Champlain, a German † | 135 |
| 1821 | At Ballyragget, Michael Brennan * | 112 | 1821 | At Fresnoen, Wævre Verdem, a female ... | 155 |

No. 1 gives forty-eight instances of ultra-centenarian longevity which have been selected from various sources prior to the year 1800, including some well-known names, and, with the exception of nine, all occurred in the eighteenth century; whilst of the nine, one occurred in the sixteenth and eight in the seventeenth century. No. 2 gives twenty-four instances of ultra-centenarian longevity in persons who have died of late years, that is, from 1808 to 1823. Whilst No. 3 gives twelve examples of ultra-centenarians who were living in the several years set against their respective names between 1818 and 1823. In this last table, although the date or year of death is not given, the number must be included in the general analysis of the ages in the whole eighty-four cases. Of these we find between 107 and 110 (but including the latter date), 10

| | | | | | | | | |
|---|-----|---|-----|----|----|----|----|----|
| " | 110 | " | 120 | .. | .. | .. | .. | 16 |
| " | 120 | " | 130 | .. | .. | .. | .. | 14 |
| " | 130 | " | 140 | .. | .. | .. | .. | 24 |
| " | 140 | " | 150 | .. | .. | .. | .. | 10 |
| " | 150 | " | 160 | .. | .. | .. | .. | 7 |

Then, after the last-named year, occurs one of each—168, 169, and 175.

Now, I do not profess to give all these instances as correct, but there are fair and reasonable grounds for believing that a certain proportion actually did reach the great age after their respective names, and every one was recorded or noticed in some way or the other in print.† According to the Thomsian

* His father was 117 years of age, his mother 109, and his wife 105. He was the father of fifteen children.

† He had several wives, and his youngest child was 28 years old at his death, making him 107 when she was born.

‡ Hugh Miller, in his "Scenes and Legends of the North of Scotland," refers to Elspat Hood, a native of Cromarty, who died in the year 1701. It is said that she attained to the extraordinary age of 120 years (p. 28, 2nd edition, 1850).

doctrine of the present day, every one is open to doubt, but I feel satisfied that, in three-fourths at any rate, the age stated may be looked upon as correct; and my reason for saying so is, that a comparatively small percentage of recorded, or rather reputed, centenarianism is found to be incorrect. The balance of testimony is altogether in favour of centenarianism, and this cannot be gainsaid by anyone who chooses to investigate the subject for himself, as I have done. Indeed, as I started for the purpose of physiological investigation, wherein it was *absolutely necessary* there should be no possible source of error, I found that, of the nine cases that came under my notice, in one only was there any reason to doubt the correctness of the age, and that has been solely because the parish register in which the baptism occurred was unknown, although the spot or locality of the birth was clear enough. But if any argument were needed to prove that the age is, for the most part, correct in these tables, I am, fortunately, in a position to supply it.

A short letter appeared in the *London Times* of August 16th, 1873, from the Rev. Arthur Loxley, of Norcott Court, Northchurch, Berkhamstead, Hertfordshire, relative to a feat he had witnessed on the morning of the 14th (the date of his letter) of the reaping of two sheaves of wheat belonging to Mr. John Mead, of Tring, Herts, by Mrs. Elizabeth Leatherlund, aged 110 years, and that her baptismal certificate could be seen at Mr. Tompkins', Tring. Now, if this were correct, so far as the age was concerned—and I had no reason to doubt it myself—then it would readily occur to one that the ages given in Mr. Rance's tables were by no means improbable, more especially as I had seen persons who had reached 105 and 106. As I left for Scotland the morning that the letter appeared in the *Times*, I had no opportunity of investigating the matter until my return at the end of September, when I corresponded with the parties mentioned in the letter. The result was, I received a photograph of the old lady from Mr. Tompkins; and on the 15th October I went to Tring, called on Mr. Tompkins, and was taken by him to see her. Of what occurred during my visit, and a description of her appearance and condition, I shall speak presently; but what I will now do is to prove the correctness of her age, and that, fortunately for the interests of both physiological and anthropological science, can be done most satisfactorily.

Her maiden name is Herne, and her parents were gipsies, her father's family of Herne, or Horam, being very well known in the counties of Herts, Bucks, and Oxon, as belonging to the wandering tribes before their encampments were disturbed by law. She was born at Chinnor, near Tetworth, Oxfordshire,

and baptised in the parish church there on April 24th, 1763, which is confirmed by this entry in the register of baptisms in the parish there for the year 1763, in charge of the Rev. Sir William Augustus Musgrave, Bart., Rector of Chinnor:—"Elizabeth, daughter of Thomas Horam, Travailer, Apr. 24." With regard to this entry, which was discovered through information furnished by herself relating to her birthplace and great age, and giving beforehand the Christian names of her father and herself, together with his occupation, which were all found to tally, it is necessary to state that she must have been a few days old when she was baptised, as is the custom with the gipsies the same as ourselves, and the name is spelt Horam, instead of Herne; but of that she herself can give no explanation. Her father's Christian name, she said, was Thomas, and the name may have been pronounced Horam, or entered as the word was caught by the parish clerk or the rector. The two names, therefore, may be taken as identical, and the gipsies consider them as synonymous. They usually give the name of their occupation as travellers or wanderers. All this, therefore, is confirmatory of the accuracy of the entry and identification of the person. Her mother's name does not appear in the register, but that was not an uncommon circumstance, at the date given, among the humbler classes; in a higher position of life both names generally appear. Her mother, she stated in reply to a question, died in childbed at Chinnor, and this may have been a reason for its omission. There is no register of her death there, and she told the Rev. Mr. Walford that her father would not tell her where she was buried; but as a gipsy, says the *Bucks Advertiser* and the Rev. Mr. Walford, she might be buried, gipsy fashion, under a hedge in a wood or common, under cover of the night, to save expense, far away from any recording agency.

In reply to a letter from the Rev. W. Walford, curate of Tring, the rector of Chinnor stated that a careful search in the register of Chinnor failed to find any similar entry with the name of Herne for thirty-seven years after—i.e. between 1763 and 1800—which, therefore, disposes of the only objection of any importance to her age that was brought forward in the *Times*—namely, that the register of an older person had been mistaken for hers.

She spent much of her early life encamped near Chinnor and other places in the three counties named, migrating with her tribe to other places in the south of England. She married Joseph Leatherlund, a private in the Bucks Militia, at St. James's Church, Dover, in 1785, and both remained in that town for several years. A search in the register of St. James's,

and also of the parish of St. Mary's, failed to discover any entry of the marriage, nor has she her marriage lines; but, as the *Bucks Advertiser* again says, this event may have been as much in the gipsy fashion as that of her mother's burial.* It must be observed, however, that the non-discovery of the record of the marriage does not affect the question of her age, as shall be presently shown.

According to her own account, she moved about to various military stations with her husband's regiment, visiting Exeter, Liverpool, and Northampton. She bare him five children, three sons and two daughters. Her first child, Samuel, was born some years after her marriage, when she was 29 years old. This she stated herself, in reply to a direct question by me, and we shall see its importance presently. The next were twins, William and Thomas; then Elizabeth; and, lastly, Saborah. The last is the only one alive, and has a perfect recollection of her brother and sister, and furnished Mr. Francis Craig, of Ripon Street, Aylesbury, with most of the information relating to them. They all lived on Buckland Common, William marrying Lydia Norwood, who also lived there, about 1848, and died without any family about 1862 or 1864. Thomas, his twin brother, never married, died at Charteridge, and was buried at Chesham twenty years ago, whilst working for Mr. Lasenby, a farmer of the former place. Elizabeth married a gipsy of the name of Herne, or Hearn, and did not live to a great age. Samuel, the eldest, with his wife and five children, were drowned many years ago in the hop country in Kent, and were buried at Hadlow, between Tunbridge and Maidstone. The date of this the old dame could not recollect when I saw her in October, 1873; I was told that there was a notice of the catastrophe in the papers at the time. Joseph Leatherlund, the old dame's husband, died at his native town of Carrick-on-Shannon, in Ireland, and was buried February 4th, 1814, when Elizabeth, his widow, returned from Ireland to her own kin, living with a relative until 1830. Saborah, the youngest daughter, who is alive, I shall speak of further on.

I learnt from Mr. Tompkins that the Rev. Ed. Owen, of the Rectory, Bradwell-on-Sea, Maldon, Essex, knew her as an old woman for forty-five years, and I believe his father did before him. But it appears, according to Mr. Francis Craig, in the *Bucks Advertiser*, that there were living lately some old men in Tring, themselves about 90 years of age, who always said they thought that "Betty," as they called her, was much older than they were; and there was one patriarch, who would have been 95

* She stated to Mr. Walford that she was living, when married, at Dover, in a certain alley, which he found was the haunt of the lowest people of the place.

this year, who bore similar testimony. Mr. Bird, the bookseller, and other inhabitants of Tring, state that forty or fifty years ago, as early as they can recollect, Betty—who was still “Old” Betty—was then quite an old woman. The people of Hertfordshire and Buckinghamshire have been generally familiar with her stooping figure, red cloak, and stick, for the last fifty years, particularly in harvest time, when this tough old gipsy was very handy with the sickle. Her last effort of this description, in the field, was witnessed by large numbers of persons, a photograph of her, with a sheaf of wheat on her knees, being taken by Mr. Piggott, of Leighton Buzzard. She used to make nets, and plod about the country selling them. For the last twelve years she lodged at Mr. Saw’s, Frogmore Street, Tring, where she was known to be a centenarian all that time, and she subsisted upon the little sums which were given her by visitors. An old man, buried in Tring churchyard, whose tombstone bears the age of 93, used to state that “Old Betty” was eight or ten years his senior, and he had known her since she was a girl.

This testimony is very good, as far as it goes, but I felt that the point of proof—the crucial point—depended upon finding the record of the drowning of her son, Samuel, and his family, at Hadlow, in Kent; and accordingly on 27th April, 1874, I wrote to my friend, Dr. Edward Miles Coverdale Hooker, of Hadlow, on the subject, asking him to make inquiries of the sexton of the burying-ground, or to refer to the register of burials. To my agreeable surprise, I received an answer on the 30th, telling me he had that morning taken a photograph of the tombstone (or really a monument) raised to the memory of the victims of the catastrophe referred to in my letter, which he kindly sent me the next day. From it I learnt the date of the catastrophe was 20th October, 1853, just twenty-one and a half years ago, and the monument gave a list of the names of all the family who were buried beneath it, as well as their respective ages, which, it appears, were accurately given by the only surviving child—a daughter—of Samuel Leatherlund himself, who was miraculously saved. Samuel Leatherlund, the father, was 59 years old, his wife, Charlotte, 56, whilst their daughter, Comfort, was 24, Selina, 22, and Alice, 18. Then there was John Herne, his nephew, aged 28, Luina, aged 26, his wife, whom Dr. Hooker wrote me was a daughter of Samuel Leatherlund, who had married a cousin, and their children, Centine, aged 4, and another child, aged 2.

When Samuel Leatherlund was born, his mother, the old dame, would have been 29 or nearly 30 years old. Had he been alive now his age would have been 81, or perhaps 82, *i.e.* twenty-nine

years younger than his mother. This fact of the age settles the question, beyond the possibility of any doubt, that old Mrs. Leatherlund is really of the very great age of 111 years, for if she was 29 years old when she says Samuel was born, then his age now would be, if he was alive, 82, because there is the calculation of some odd months not taken into account. With the humbler classes the rule is more invariable than with the wealthy, that almost every mother recollects what her age was when her first-born child came into the world.

What now was to be done was to refer to the newspapers of the time for an account of the catastrophe. And this was readily accomplished in that invaluable repository, the library of the British Museum. There I referred to the *Times*, the *Illustrated London News*, *Kentish Observer*, *Rochester Gazette*, and the *Maidstone and Kentish Journal*.

In the *Times* of Saturday, October 22nd, 1853 (p. 7), was an account of what was described as "A Fearful Accident on the River Medway." A party, consisting of men, women, and children, were drowned by the overturning of a waggon, containing nearly forty persons, into the river Medway, then swollen with recent rains, when crossing a wooden bridge, and that nearly all were missing. In the same paper of Monday, 24th October (p. 10), was a column and a quarter, giving an account of the accident, and the particulars of the coroner's inquest. Among the names of the drowned were Charlotte Leatherlund, aged 55, and her daughter Comfort, aged 24. Then among the survivors were Fanny Leatherlund, who said that Charlotte Leatherlund was her mother, and that her father and mother and sisters were all drowned. She had three sisters, a brother-in-law, and a little baby, who had not been found. A little girl, Herne, belonged to her sister. When the waggon containing the people, about forty, was descending the opposite side of the bridge, one of the horses tripped or stumbled, the hind wheel broke the rotten fence of the bridge, and the earth next to it giving way, the waggon with its contents was dashed into the water, and thirty-seven persons had perished. The river had overflowed from late heavy rains; the current, therefore, was very rapid, and the loss of life great.

In the *Times* of October 25th (p. 17), some further particulars were given, and the mention of other bodies recovered. There was an account of the burial of some of the bodies at Hadlow, giving the names, particularly, of Samuel, Charlotte, Comfort, and Selina Leatherlund, with others of a family who belonged to the gipsy tribe. All these people were in the employ of Mr. Cox, hop-grower, and had been engaged in hop-picking.

In the *Illustrated London News* of October 29th, 1853 (p. 367),

is an account of what is there called a "Frightful Accident on the Medway," which gives the same particulars as in the *Times*. It states that the lamentable result of the drowning of some thirty-two persons was chiefly due to the struggling of the mass of human beings with one another in the water. On the next page of the same paper is an engraving of the "Upper Great Hartlake Bridge over the Medway, Hadlow, the scene of the late Accident." It mentions that all were interred in Hadlow churchyard, and the list included the following persons, who were the children, grandchildren, and kinsfolk of the old dame recently alive:—Samuel and Charlotte Leatherlund and their children, Comfort, Selina, and Alice; also John Herne and his wife, Centine, and their two young children.

In the *Kentish Observer* of Thursday, October 27th, 1853, is an account of the accident, with the inquest, occupying a column and a half; it is described as occurring at Tudeley, near Tunbridge. In the *Rochester Gazette* of Tuesday, October 25th, 1853, is likewise a column and a half about the accident, and the mention of thirty-seven persons drowned. Whilst in the *Maidstone and Kentish Journal* of the same date, in which three columns are devoted to the subject, the number is stated to be thirty-five. This last paper gave the names and ages of all those lost, as near as could be ascertained, including Samuel and Charlotte Leatherlund, and their three grown-up daughters, Comfort, Selina, and Alice, and Looney (for Lavinia) Hearn, and Centena her child.

I have been particular in giving the references to the names of the family, to clearly establish their identification and relationship with the old dame recently alive, and upon that point there can be no dispute. In my conversation with her in October, 1873, she told me that her son *Hiram* and his family were drowned, but she meant Samuel, and it appears she had a descendant of that name. Mr. Tompkins ascertained from her that her two sons, Thomas and Samuel, were born and baptised at Dover, where her husband then was as a soldier. Two other children, daughters, were baptised at Welford, in Northamptonshire. Her youngest and only surviving child, a daughter named Saborah, as I said before, is alive, and her baptism occurred at Bovingdon Church, Hemel Hempstead, Herts, as the Rev. W. Walford kindly informed me. In the register she is called Sibirah, daughter of Joseph and Elizabeth Leatherlund, soldier. She was baptised May 21st, 1815, and born, the register says, March 28th, 1815. As Joseph Leatherlund was buried Feb. 4th, 1814, she was born 13½ months after that date. She is married to a Mr. Wright, a well-to-do agricultural labourer, residing eight miles from Tring, employed

by Mr. Thomas Gee, of Bellingdon, and is the mother of nine children, all now living, the eldest 37 years old, a son, and the youngest 16; six of them are married, who have twenty children among them. These last are the great grandchildren of the old dame. When Saborah was born, her mother, the old dame, had turned 51, and was, indeed, close upon 52, an age that is sometimes, though not commonly, fruitful; yet of my own knowledge, in the early part of my medical life, I have seen that age exceeded several times in persons who bore children. And if this fact were overlooked here, it would be laid hold of by the Thomsians as an argument against the correctness of the age of the old dame her mother. But to show that women do bear children much over 50, the following is given from the *Cork Advertiser*:—"Oct. 2nd, 1830, at Laughnamoneen, county Clare, aged 63 years, the wife of Mr. James Lysaght, of a daughter. Her husband is in his 73rd year. This happy couple had had no increase to their family for the last twenty years."

Having now considered all the facts bearing upon the extreme age of Mrs. Leatherlund, which, it seems to me, would be considered proved in any court of law, I shall now proceed to speak of my interview with the old dame herself, and will finally give the views I arrived at concerning her physical condition, being the result of my careful examination of her.

It was on the 15th October, 1873, that I went to Tring, and was taken to see her by Mr. Tompkins, of that place, who, I am bound to acknowledge here, has not only taken a deep interest in her welfare himself, but has spared neither trouble nor inconvenience to introduce the old dame to visitors possessing an interest in persons of such an advanced age. The day was fine and beautiful, though showery, and on getting to Tring early in the afternoon and calling on Mr. Tompkins, he took me to a lodging-house known as the Red Lion Inn, back of the church, where the old dame was living. In a few minutes she toddled into the room, with the aid of a stick, being partly supported at the same time. She was of short stature, a little bent with age; her complexion was brownish, for she was of gipsy descent; her countenance was a series of thick folds, not wrinkles, and she was most unmistakably many years older in appearance than any of the nine other centenarians I had examined thus far. She shook hands with me, conversing and chatting away continually in a good, clear, and distinct voice, not tremulous nor cracked, saying she was glad to see me and Mr. Tompkins. Her sight was not now very good, although she could distinguish things tolerably well, and even knitted twine bags, two of which she gave me; yet it was becoming

impaired. One eye, I was told, had little or no sight. She could not see to read, but she could distinguish persons and things. She was remarkably intelligent and communicative, though her memory was now becoming a little impaired. Unless she was asked questions she was continually talking, indeed, I might say was garrulous, like many old people. The subject of our conversation was at first bearing upon her age and family history, in which most of the facts already related were gone over, and especially her age when her first child was born. Then it related to her health and physical condition, and her replies to my questions, when clearly put and made easy to her mind, were such as I had every reason to be satisfied with. She heard pretty well, on the whole, but was a *little* deaf; yet the faculty of hearing was tolerably perfect, as she heard almost every question put to her. The sense of smell was perfect; she took snuff in moderate quantity, which she greatly enjoyed. So was the sense of taste. She had never smoked, and had always been regular and temperate in her habits. The skin was generally dark, her hands particularly so, yet it was as soft as velvet—indeed, I never felt a softer, and it was thin on the backs of the hands. Mr. Lipcombe, who attended her when necessary, told me it was in great folds about the body, as on the face. Her hair was quite grey; she was not bald. The forehead was not a broad one—indeed, the head was narrow, and looked as if laterally compressed. The muscles of the neck stood out in prominent relief, particularly the sterno-cleido-mastoid, with great hollows in front and behind it, especially at its lower part, from the entire absence of any adipose or fatty tissues. As concerned her physical condition, she breathed wholly by the chest, and not the abdomen—that is to say, the chest expanded during inspiration readily, owing to the resiliency of the costal cartilages, which were not ossified, as is usually the case in persons approaching 70. The breathing was slow, regular, and uniform, not at all hurried, even during our conversation. The lungs themselves were in a perfectly normal condition, the breathing being clear and distinct all over the chest. The heart's action was regular and natural, with a feeble impulse, but not an abnormal sound was heard. The pulse at both wrists was free from any induration, and was quite soft, as in a girl; it beat regular and uniform, about 68 per minute. No calcification nor hardness of any kind was to be felt in the arteries of the arm, the neck, or the temples. The heart and the lungs, therefore, were perfectly free from any of the changes of advanced life, so far as could be made out by careful examination. After some little difficulty, when her intelligence was appealed to—for at first she

became frightened, lest she should be choked—she permitted me to introduce the laryngeal mirror into the back of the fauces, and there a splendid view was obtained of a vertical or erect epiglottis, of a leaf-like form, and a perfect larynx, with short vocal cords, normal in colour, with a triangular glottis. Indeed, all these organs were those of a young person. Externally the thyroid cartilage, small in size, felt quite soft and flexible, and could be compressed laterally, and gave a cartilaginous, gliding sensation over the cricoid; and the trachea could be flattened either laterally or anteriorly, all showing the absence of senile changes.

With the perfection of the respiration and the circulation we should naturally expect a good digestion, and so there was, for the organs concerned in it were healthy. She had, however, only three teeth in front, in the lower jaw, with two or three molars, and several in the upper jaw, especially of molars; not one was decayed in the least. The tongue was large and healthy, and the faucial mucous membrane of a pale pink. On the whole, her appetite was fairly good, although now and then a little indigestion occurred after her tea, which, no doubt, was the cause of some itching of the skin at night on going to bed; at least, that was when I saw her, but probably there was nothing of the kind afterwards.

After a long conversation and the conclusion of my examination, I bid her farewell, receiving a bunch of the wheat she had helped to reap, besides the two bags of twine, which I venture to produce at this meeting. I thought at first she was supported whilst reaping, but it appears not; she managed to do it without assistance.

The result of my examination of her, which was longer and more elaborately conducted than in most of my other examples, went to prove the same facts, that there was an absence of those changes of old age so commonly met with in persons of from 70 to 80. She was more like a girl, constitutionally, than an aged person; yet there was the indication of feebleness necessarily to be expected, which, *ceteris paribus*, did not prevent her reaching to her present exceptionally great age.

Such, then, were the physical conditions presented by the old dame, and a consideration of such an extreme instance of longevity teaches us two practical facts: one is, the absence of senile changes, as commonly understood by the physiologist, and which, I maintain, is the chief reason of centenarians attaining to such a great age; and the other is, that if a person like the old dame reaches to the age of five and a half score years, others may do the same, and therefore it will not do to ignore what must be apparent to common sense—namely, the

occurrence, now and then, of instances where even the great age of six score is reached.

As a practical and conscientious physiologist and physician, I have only one object to serve, independently of any theory to uphold, and that is the propagation of truth and, of course, the correction of previous errors. But at the present day it would be preposterous to ignore cases or instances of exceptional longevity of former years because we cannot discover the proofs of their age in our time. There can be no doubt in times past there were men as conscientious and painstaking as exist now, and to ignore their facts and upset their reasoning, without just cause, is unjustifiable, unscientific, and unphilosophical. In saying this, I allude to the doubts cast upon many cases of ultra-centenarianism of a remarkable nature, that are historically known to almost everybody. A great deal was made of such examples in the times of their occurrence, and they were under personal observation for a long period of time, and it may be considered certain that there existed a strong desire then, as now, to arrive at the truth, and not to have any imposture palmed off upon the people. I trust, however, that the example of extreme longevity now brought before the Institute will do some good, for its authenticity has not only been proved by evidence of a recorded character, but it has been confirmed by an examination in which comparison with other centenarians has declared it to be older than any that has personally come under my notice.

In conclusion, it may be said that no one can converse upon the subject of centenarian longevity, write upon it, or discuss it in any way, without having the English Thomsian doctrine thrust before one, even by persons who acknowledge its fallibility. Such an instance as Mrs. Leatherlund wholly explodes it, and it will scarcely live as long as did its American Thomsian brother, that must be known to the medical practitioner of at least 25 years' standing. The logic of the Thomsians at first was that no person ever reached the age of 100 years, and when their premises were found to be untenable, from the number of genuine instances brought forward, the not less ridiculous ground was taken up that at any rate none overstepped the century. My argument is, if clearly authenticated instances occur of the age of 105, 107, and 109 years, there can be no reason against the assumption that persons whose organism is free from the changes of old age, as in centenarians, can and do live much farther still, and it explains the occurrence now and then of the truly exceptional ages reached of 120, 130, 140, and even higher.

Since this paper was written, the old dame, after a very slight

illness, so slight that it merely confined her indoors for two or three days, passed away from this life. On the 19th of January, 1875, a letter from my friend Mr. R. N. Lipcomb, surgeon, of Tring, who had occasionally seen her during life, informed me of her death the preceding night. He stated that in the certificate of death he had filled in her age as 112. Next morning I proceeded to Tring by an early train, to meet him, for the purpose of examining her. Unfortunately he was called away to a distance, but he left instructions with his assistant to aid me in his absence, and we proceeded together to Mr. Saw's, the Red Lion Inn, Frogmore Street, where I made the autopsy myself, the assistant recording the appearances as they were described to him. The particulars of this are given here, as they add greatly to the value and interest of such a well authenticated example of ultra-centenarian longevity as was the old dame's, which is sure to be consulted hereafter by everyone interested in the subject.

Autopsy at 12.30, about thirty-six hours after death.—Height during life was four feet nine or ten inches; the body, therefore, was small, and proportionate to her height. The rigor mortis was slight, and no odour was exhaled from the body. The integuments generally were of a yellow colour, with a shade of brown, but not darker than they appeared during life. They were a little loose over certain parts of the body, but the attenuation of the muscles, especially about the neck, did not seem to be so great as when she was seen by me in October, 1873. The muscular development generally was fairly good, and no decided emaciation to speak of existed. The mammae were firm and well developed, though small, with no dark areolæ around the nipples. Over the abdomen were the usual marks seen in persons who have borne children. In sewing up the body afterwards, the skin was so tough that the needle would scarcely penetrate it. On reflecting the integuments over the chest and abdomen, a little adipose tissue was found over the pectoral muscles, and over the abdominal muscles it varied in thickness from an eighth to nearly a quarter of an inch. The cartilages of the ribs at their junction with the bone were cut through with the greatest ease and facility, the knife meeting with no resistance from any osseous changes. The cut surface presented a narrow rim of true white cartilage, whilst the other part possessed a brownish tinge, the result of some change allied to fatty degeneracy, for a slight roughness was manifest to the finger, although the middle structure was quite soft; but before division of the costal cartilages the thorax could be compressed with ease, through their elasticity, as I had seen during life.

The lungs were healthy, crepitant throughout, and had the

usual appearance. Some slight congestion of the posterior part of the left was present, which, to some extent, may have been hypostatic; yet, associated with what was described as a trifling cold, it was the immediate cause of death. At the apex of each lung was a trifling adhesion, readily broken down, the connecting membrane having the appearance of ordinary areolar tissue. Both lungs at the margins of their lower lobes had an emphysematous fringe. The heart was perhaps a little large in proportion to the size of the body; it weighed, with the arch of the aorta, thirteen ounces exactly. In structure it was soft, a little flabby, and had a slight covering of fat. The coronary arteries were distinctly observed, but had not undergone any change. The right side of the organ was filled with dark clots of blood, whilst the left was empty. The muscular structure, cavities, and valves appeared to be normal. The arch of the aorta generally was enlarged, dilated, and somewhat attenuated; at its commencement the circumference was four inches and one-sixteenth, whilst at its termination it was three inches and one-fourth. An atheromatous patch, the size of a silver three-pence, was present on the lower surface of the transverse portion of the arch, whilst at the commencement of the anterior and left part of the ascending portion a ridge of atheroma existed, which did not involve the semilunar valves.

On opening the abdomen scarcely any trace of the omentum was observed. The stomach and alimentary canal were perfectly healthy, and not distended with flatus. The liver was of fair average size for the body, of firm, healthy structure, possessing a light claret-brown colour, and free from any white spot or patches. The gall-bladder was large in proportion to the liver, and filled, but not gorged, with bile; it contained no biliary calculus. The spleen was of the usual purple colour, comparatively small, slightly curved in shape, but healthy and firm. Both kidneys appeared to be healthy, the cortical and medullary portions fairly distinct, but in general structure soft and flabby. The ureters were normal, and so was the bladder, which was nearly full of urine. The uterus was very small, the Fallopian tubes and ovaries equally so, all quite healthy. The thoracic and abdominal aorta and other blood-vessels were soft, and free from any abnormal changes. The tongue, larynx, and trachea were removed for examination. Some of the papillæ on the dorsum of the tongue were much enlarged. The larynx was small and compact; the epiglottis, which had a slight notch on its superior margin, possessed the natural colour, shape, and appearance of early life. The vocal cords, short in length, had the merest tinge of yellow, but were otherwise normal. The aryteno-epiglottidean folds, the ventricles,

and all other parts of the larynx were as perfect in their formation as in a young person. All the cartilages of the larynx were flexible, with an absence of any calcareous changes, unless in the central solid parts of the wings of the thyroid. The rings of the trachea were white and glistening, perfectly flexible and soft, and could be compressed in any direction. The os hyoides was thin, the great cornua slender, one of them fractured on removal, and the right lesser cornu elongated.

I must not forget to mention that the cornea of both eyes was free from any *arcus senilis* or annulus, although her sight had not been very good of late years. Yet she had been able to knit twine bags almost to the very last.

It remains to say that any merely hearsay evidence brought forward against the old dame's age, such as has been furnished by the Rev. H. A. Harvey, late Vicar of Tring, or by Shadrach Hearn, her nephew, quoted in a letter by Mr. Parfitt, simply counts for nothing, when unsupported by documentary evidence. Even supposing her nephew to be correct, that her elder brother died at Nottingham in 1867 aged 100 years, and that she was two years younger than he, she would now be 104. That she was older than this brother by seven or eight years has been proved in a manner that cannot be questioned, in consequence of the most remarkable confirmation of the age given at which she was confined of Samuel, her firstborn, a circumstance which none but a medical mind could conceive, and upon which a medical jury would unanimously give their verdict as final and conclusive.

DISCUSSION.

MR. BRABROOK, while complimenting Sir Duncan Gibb on the interesting physiological details he had given, and on the industry of his researches, was bound to say that, in his opinion, the evidence as to Betsy Leatherlund's having attained the age of 112 years was insufficient. She was, no doubt, a very old woman; certainly 98 years old, perhaps 100, but not much more. As to her identity with the person whose birth certificate Sir Duncan had quoted, there was no evidence. As to her marriage, there was no certificate of it; and with regard to its alleged date, had it been ascertained whether at that date the husband was really serving in the militia? [Sir Duncan Gibb: Yes.] Mr. Brabrook had been otherwise informed. Then the alleged interval between the marriage and the birth of the first child was a doubtful circumstance. Another circumstance of grave doubt was the birth of an illegitimate child when the mother would have been, if her alleged age be true, 55 years old. There must have been a dearth of young women of loose character in Tring if a gipsy widow of 55 attracted the attentions of the seducer. If, on the other hand, she was (as the speaker thought) at that time a buxom gipsy widow of 40, it was

not so improbable. In cases of alleged ultra-centenarianism, there was a tendency to exaggeration, which rendered it necessary that the statements of the most respectable and trustworthy old people should be corroborated. In this case, unhappily, the character of the poor old woman, her race, and habits of life, had been such as to deprive her unsupported statements of any weight whatever. With regard to the general question of centenarianism, Mr. Brabrook remarked that he thought the views of his friend Mr. Thoms were much misunderstood. Mr. Thoms's researches had established several cases of undoubted centenarianism. All he said was, that when you hear 105, 110, or 112 years of age talked about, you may be sure there is some mistake. Indeed, the speaker had within the last few days supplied Mr. Thoms with particulars from the National Debt Office of three cases of undoubted centenarian annuitants, one of them a gentleman who had recently called to receive his own annuity, and appeared in excellent health.

Mr. F. GALTON thought it erroneous to conclude that because the chances were so and so to one against a woman living to 112, and so and so to one against a woman bearing a child at the age of 52, that the chance of the double event was compounded of these two chances. It would be so if the two events were independent variables, but in this case they probably were not so. It was more likely that a woman, constitutionally fitted to live to an extraordinary age, would have the period of her youthfulness prolonged beyond that of ordinary women. As another matter of statistical theory, he would mention that he regarded the ages in the table submitted by the author, of an indiscriminate list of persons who had lived beyond 100 years, with extreme distrust, because the way in which its figures were distributed contradicted all experience of death-rates, and similar matters. It was well known that many fewer persons died between the ages of 80 and 90 than between those of 70 and 80; still fewer between 90 and 100 than between 80 and 90; and we have every right to assume that a similar law would continue to prevail during each successive decade. The figures in the table ought to give a distinct indication of this law, whereas they do no such thing. The table even asserts that there have been twenty-four cases of death between 130 and 140, as against sixteen between 120 and 130, and the same number between 110 and 120. The capricious distribution of these figures, and the number of times in which 130 occurred, afforded, in his opinion, a conclusive testimony of their worthlessness. He would conclude by asking the author whether he could throw any light on the ultimate cause of gradual decay and death—that is to say, what it was that produced these senile changes, which were sufficient by themselves, without the aid of any specific morbid condition, to limit the period of life. He had been much struck by a remark in some recent lectures by the great French physiologist, Claude Bernard, that the final cause of these changes and deteriorations lay in the incapacity of the several cells, of which all tissue is composed, to generate fresh cells as their successors, for an

indefinite time, by their process of subdivision. It was pretty well established that no organism can perpetuate itself except by means of sexual generation, and that all continued propagation by grafts, buds, or other asexual methods, tends to produce decay and extinction; and M. Claude Bernard considers senile deterioration to be due to this law. He would be glad to hear the author's opinion on the subject generally.

MR. SCRATCHLEY wished to ask Sir Duncan Gibb if, in his reply, he would kindly state more fully his reasons for considering the statement made by Mrs. Leatherlund's nephew unworthy of credit? He understood Sir Duncan Gibb to say that the nephew had written to the *Times* to the effect that Mrs. Leatherlund's brother had died, a year or so before, at the age of 102, or thereabouts; and that, as he was her *elder* brother, Mrs. Leatherlund could not, in 1873, have been 110. Mr. Scratchley did not quite understand why Sir Duncan Gibb had dismissed this statement as unimportant.

MR. HOWORTH, Major OWEN, and the PRESIDENT also joined in the discussion.

SIR DUNCAN GIBB, in reply, thanked the members present, not only for their patience in listening to his paper, but also for the encomiums of some of the speakers. He had heard the name of Pratt, aged 105 years, but had never seen him; and Baron Dessaix, of the same age, was not unknown; he is some four years younger than Count Waldeeh, the painter, who is still alive. Relative to the age of 51, at which Mrs. Leatherlund had her last child, there is nothing extraordinary about that; and the other instance, referred to by Mr. Howorth, did not occur in the same family, but was an instance brought forward by the author, taken from a Cork newspaper, showing that after an interval of twenty years a woman, aged 63, bears a child to her husband, much older than herself. The question propounded by Major Owen is a very pertinent one, and he (the author) thinks it helps to explain why Mrs. Leatherlund procreated in her 51st year; for undoubtedly where all the functions of life were so perfect as to permit her to reach the great age she did, physiologically speaking, therefore, at 51 she would be physically the equivalent of a female of 25 or 30. And although he had not read the details of the autopsy of the old dame, the womb was small, and its appendages were perfectly normal, a circumstance that is not always the case in old people. Then, again, although she was married some years before she had any family, it did not necessarily follow she was an immoral person, notwithstanding her last child was born some thirteen months after the death of her husband. Upon this last point, for the sake of the living, he should keep silent. In reply to Mr. Brabrook, and also the President, he would say that the fact of the marriage not being found recorded does not in the least affect the accuracy of the great age, because when the old dame had the question put to her point blank, such as you would expect a medical mind to conceive, "What was your age when your first child was born?" she unhesitatingly replied, "29, or between 29 and 30." Then, again, she said she

was some years married before her eldest child was born. This proved to be Samuel, who lost his life, in the manner described, with so many other persons; and, singularly enough, one of Samuel's children, a married daughter, happened to be saved, who, it is reasonable to assume, furnished the different ages on the monument. Upon that Samuel's age was 59; if living now he would have been 82, which gives 29 as his mother's age when he was born. This testimony is so clear, so overwhelmingly convincing, that not a single objection brought forward by Mr. Brabrook, or by his friend Mr. Thoms, can have the slightest weight against it. Then all the alleged circumstances of her life are abundantly proved. The history of the Bucks Militia, in which the old dame's husband was a private, is readily explained by the movements of the regiment to the various towns named, and in the muster-rolls his name would as certainly be found as that the regiment existed. Necessarily some difficulties must be expected in such an instance as the present, from the woman being a gipsy, although there is no proof that her husband was; he died in his native town in Ireland, and his burial is correctly registered. After that event she returns to the vicinity of the spot where she passed her youth. Mr. Francis Craig mentioned, in a letter to the *Times*, that the absence of senile changes, as found by the author, was an argument in favour of her age; but he (Sir Duncan Gibb) must distinctly state that he never brought that forward himself, and it is of no value at all in this question. Taken with other circumstances, it shows she was the same as all other centenarians physically. Then, again, the entry of her baptism cannot be that of an older person, as supposed by Mr. Brabrook, for she furnished the information herself which led to its discovery, a fact that would be conclusive of her age in a court of law, because no other person could have given the clue to this but her. The names of Horam and Herne are synonymous among the gipsies, which readily accounts for the former in the register. And no entry with either name occurs for some thirty-seven years afterwards in the same register. He (the author) admitted it was not pleasant for either Mr. Thoms or his disciples to have a case confirmed like that under consideration, because it wholly negatives their premises. And he took exception to some of Mr. Thoms's *post-mortem* refutations in his book, because they were not made during the lifetime of the parties, when there was a chance of personal explanation. In the consideration of his paper, it required a medical mind to discuss some of the questions, for, as it should be readily understood, the old dame procreating at 51 cannot in the least affect the question of her age, as he had already stated. He would not go into the question of life, nor reply to that of "Why we die?" asked by Mr. Francis Galton, because it is beside the matter. No doubt as age advances, if there is no actual disease, the great functions of life gradually come to an end, and death occurs. In extreme old age, although all the functions are natural, and regularly performed, as in the old dame, there is necessarily feebleness, which permits a puff of wind to extinguish life; for

the merest cold was sufficient to do so in her. He had nothing further to say in reply, beyond reiterating the fact that all he had brought forward satisfactorily confirmed the age of the old dame, which would be acknowledged by the impartial reader of his paper in future years.

The meeting then separated.

MARCH 23RD, 1875.

Colonel A. LANE FOX, *President, in the Chair.*

The minutes of the last ordinary meeting were read and confirmed.

The election of Colonel W. J. FORLONG was announced.

The following list of presents was read, and the thanks of the meeting were voted to the respective donors.

FOR THE LIBRARY.

From the SOCIETY.—Proceedings of the Royal Society. Vol. XXIII. No. 159.

From the SOCIETY.—Proceedings of the Royal Geographical Society. Vol. XIX. No. 11.

From JAMES BURNS, Esq.—Human Nature, March, 1875.

From the ASSOCIATION.—Annual Report of the Geologists' Association, 1874.

From the EDITOR.—Nature (to date).

From the EDITOR.—Revue Scientifique. Nos. 37 and 38. 1875.

FOR THE MUSEUM.

From HENRY P. LE MESURIER, Esq.—Three Boomerangs from Kattyawar, Bombay.

A letter from Mr. H. P. Le Mesurier was read, in which he presented boomerangs, &c., to the museum, and lent for exhibition an unbaked cooking-pot from the Andamans.

Major OWEN drew the attention of members to the alleged discovery of works of man in Switzerland of high antiquity.

The PRESIDENT (the Rev. DUNBAR I. HEATH, *Treasurer*, in the chair) read the following communication:—

NOTE on the CHEST MEASUREMENT of RECRUITS. By Colonel A. LANE FOX. [With woodcuts.]

ATTENTION having lately been drawn in Parliament to the method employed in the army of taking the chest measurement of recruits, it occurred to me that some statistics on the subject, obtained by me in my capacity as the commander of a brigade dépôt, might be of interest to the Institute.

My attention was first drawn to the difference of chest

measurement caused by passing the tape across or beneath the bladebones, by the fact of a man enlisted by me, and passed with a chest measurement of 33 inches, having been subsequently rejected as having only 29 inches measurement, and within a month re-enlisted in another place, and again passed as measuring 33 inches. This was, of course, an extreme case, but in order to avoid such an occurrence in future, I determined to have two measurements taken—one horizontally, according to the army regulations, and the other obliquely, under the bladebones. The results are given in the annexed table (pp. 104, 105).

It is probable that cases of the same kind must have occurred elsewhere, for on the 8th of the present month the subject of chest measurement was brought to the notice of the House of Commons by Colonel Mure, whose remarks I here copy from the *Times* of the 9th inst.:—"There were two fallacies," he said, "about chest measurement and the testing of vision. It was usual to measure the chest below the scapulae, or shoulder-blades, but in the army it was now the practice to ask the recruits to hold up their arms, to put the tape over the arm-pit, and then to lower the arms and measure the chest with the tape passing over the shoulder-blades. In this way advantage was sometimes given to a weedy man, who came out with a magnificent chest measurement; whereas, if he were measured properly, he would have none at all. Formerly the sight of recruits used to be tested at a distance of fifteen paces, but two or three years ago the distance was reduced to ten paces." Here I may observe that Colonel Mure has made a slight error. The recruit is not measured immediately under the arm-pit, and the object of making the recruit hold his arms up is not to increase the measurement, but merely to get them out of the way whilst the tape is being properly adjusted on the line of the nipples.

The order, as laid down in paragraph 11, section 19, of the Queen's Regulations, is as follows:—"The recruit is also to be measured by placing the measuring tape quite horizontally round the chest, the lower edge of the tape touching the upper part of the nipple, with the arms hanging loosely; the tape should not be drawn so tight as to compress the surface. The recruit should then be made to count slowly from one to ten, to prevent any undue inflation of the chest. The length in inches shown on the application of the tape is the correct chest measurement." The effect of counting ten slowly is usually to reduce the measurement from $\frac{1}{2}$ to 1 inch.

Mr. Hardy, in his reply to Colonel Mure, said that he should consider it his duty to institute a careful inquiry, particularly as to what had been said about chest measurement and the

testing of vision. "It would be a serious thing indeed," he said, "if they were of the superficial character represented."

This being the state of the case, and as the measurements taken by me are extra-official, I am at liberty to communicate them. I thought that the members of the Institute might like to know, from the statistics thus obtained, how the matter really stands in regard to these two measurements.

With the exception of a short period, during which, owing to a misunderstanding, the second measurement was omitted, I have had every man who was enlisted at Guildford measured in both directions, and the results are given in the accompanying nominal list of the recruits measured. One hundred and thirty-six men are included in the return. Of these there are ten instances in which the oblique measurement exceeded the horizontal, twenty in which the two measurements were the same, and in the remaining one hundred and six cases the horizontal measurement exceeded the oblique measurement.

But we obtain this additional result from the return. In May, 1874, the standard for infantry was raised from 5 feet 4½ inches to 5 feet 5 inches, or, rather, the permission to enlist men at the lower stature was cancelled. Having observed that the difference between the two measurements, that is, the excess of the horizontal over the oblique measurement, was less since the standard was raised, I caused the return to be made out in the order of heights, placing the shortest men at the top of the list, and having divided the whole into two nearly equal divisions, I found that in the division in which the height was under 5 feet 6 inches the average horizontal measurement is .7 of an inch more than the oblique, whereas in the division in which the height exceeded 5 feet 6 inches, the average excess of the horizontal measurement is only .53. (See figs. 1 and 2, p. 106.) And further, taking the first fifteen men on the list whose height is under 5 feet 5 inches, I found that the excess of the horizontal over the oblique measurement amounted to exactly 1 inch.

From this we see clearly that the excess of the horizontal over the oblique measurement bears a certain ratio to the height, that is to say, it diminishes as the height increases. The reason for this is easily explained. I do not give any return of the ages of these men, because no return of age would be reliable. The men who wish to enlist sometimes give their age at 18 when they are under that age, and it is often difficult to judge of the age of a youth in that class of life.

In young, undeveloped lads the shoulder-blades protrude more than when they are of mature age; the muscles under the arm have not yet filled out, which is shown by the fact that after a few months' service, with better feeding, the chest

measurement increases considerably, and the taller men, as a rule, are better made. The result tells in favour of maintaining the standard at its present height. If the same results were confirmed by more extended statistics of the same kind, they would serve to show, in all probability, that any reduction of height below 5 feet 5 inches would be accompanied by a great falling off in the stamina of recruits.

Then as regards the question whether the horizontal or oblique measurement of the chest secures the best results, I leave it to physiologists to determine which of the two measurements affords the best test of strength and stamina. It is only where the height of the individual is below 5 feet 5 inches that any very marked difference is seen, and as this is now below the standard for the infantry, it does not apply. But it must be borne in view that the horizontal measurement is the most easily regulated throughout the service. If the oblique measurement were to be sanctioned, it would be open to the recruiting sergeant to give a greater or less degree of slope to the tape, according as it might be his interest to pass or reject the man; and as, for the reasons already given, this is a question which also affects the pay, and consequent efficiency, of the recruiting sergeant, it appears desirable to adhere to that mode of measurement by which uniformity can be most readily secured. The same remark, I need hardly say, applies with nearly equal force to measurements taken with a view to anthropological statistics.

RETURN SHOWING THE CHEST MEASUREMENT OF 136 RECRUITS WHEN TAKEN HORIZONTALLY, ACCORDING TO THE QUEEN'S REGULATIONS, AND WHEN TAKEN OBLIQUELY, SO THAT THE TAPE PASSES BENEATH THE SHOULDER-BLADES.

| Re- cruits.* | Height. | | Chest Measurement. | | Re- cruits.* | Height. | | Chest Measurement. | |
|-----------------|---------|---------|--------------------|------------|-----------------|---------|---------|--------------------|------------|
| | Feet. | Inches. | Horizon- tally. | Obliquely. | | Feet. | Inches. | Horizon- tally. | Obliquely. |
| | | | Inches. | Inches. | | | | Inches. | Inches. |
| 1 | 5 | 4½ | 34 | 32½ | 16 | 5 | 5 | 34½ | 34½ |
| 2 | 5 | 4½ | 33½ | 31½ | 17 | 5 | 5 | 33½ | 31½ |
| 3 | 5 | 4½ | 34½ | 33½ | 18 | 5 | 5 | 34 | 33½ |
| 4 | 5 | 4½ | 34 | 32½ | 19 | 5 | 5 | 34½ | 35 |
| 5 | 5 | 4½ | 36 | 35½ | 20 | 5 | 5 | 34 | 33½ |
| 6 | 5 | 4½ | 33½ | 33½ | 21 | 5 | 5 | 33 | 33 |
| 7 | 5 | 4½ | 36 | 34½ | 22 | 5 | 5 | 34½ | 34 |
| 8 | 5 | 4½ | 35½ | 33½ | 23 | 5 | 5 | 34½ | 34½ |
| 9 | 5 | 4½ | 33½ | 32½ | 24 | 5 | 5 | 35½ | 35 |
| 10 | 5 | 4½ | 33½ | 33 | 25 | 5 | 5 | 36½ | 36 |
| 11 | 5 | 4½ | 34½ | 35 | 26 | 5 | 5 | 35½ | 35 |
| 12 | 5 | 4½ | 35½ | 35½ | 27 | 5 | 5 | 34 | 34½ |
| 13 | 5 | 4½ | 34 | 33½ | 28 | 5 | 5 | 33½ | 34 |
| 14 | 5 | 4½ | 33½ | 32½ | 29 | 5 | 5½ | 34 | 33 |
| 15 | 5 | 4½ | 33½ | 31½ | 30 | 5 | 5½ | 35 | 34 |

* Numbers are inserted in this column instead of the names of the recruits, which appeared in the original return.

| Re- cruits. | Height. | | Chest Measurement. | | Re- cruits. | Height. | | Chest Measurement. | |
|----------------|---------|---------|--------------------|------------|----------------|---------|---------|--------------------|------------|
| | Feet. | Inches. | Horizon- tally. | Obliquely. | | Feet. | Inches. | Horizon- tally. | Obliquely. |
| | | | Inches. | Inches. | | | | Inches. | Inches. |
| 31 | 5 | 5½ | 33 | 33 | 84 | 5 | 6½ | 35½ | 36 |
| 32 | 5 | 5½ | 34½ | 33 | 85 | 5 | 6½ | 35½ | 34½ |
| 33 | 5 | 5½ | 35½ | 35 | 86 | 5 | 6½ | 33½ | 33 |
| 34 | 5 | 5½ | 36 | 35½ | 87 | 5 | 6½ | 33½ | 32½ |
| 35 | 5 | 5½ | 33 | 32½ | 88 | 5 | 6½ | 35½ | 34½ |
| 36 | 5 | 5½ | 35½ | 35½ | 89 | 5 | 6½ | 35½ | 34½ |
| 37 | 5 | 5½ | 33½ | 32½ | 90 | 5 | 6½ | 33 | 32½ |
| 38 | 5 | 5½ | 33½ | 32½ | 91 | 5 | 6½ | 34½ | 34 |
| 39 | 5 | 5½ | 37½ | 36½ | 92 | 5 | 6½ | 37½ | 37½ |
| 40 | 5 | 5½ | 36½ | 35½ | 93 | 5 | 6½ | 33½ | 33 |
| 41 | 5 | 5½ | 34½ | 33 | 94 | 5 | 6½ | 35 | 34½ |
| 42 | 5 | 5½ | 35½ | 34½ | 95 | 5 | 7 | 35 | 33½ |
| 43 | 5 | 5½ | 33 | 32 | 96 | 5 | 7 | 37½ | 36½ |
| 44 | 5 | 5½ | 33 | 32½ | 97 | 5 | 7 | 36½ | 36½ |
| 45 | 5 | 5½ | 34½ | 34½ | 98 | 5 | 7 | 36½ | 35½ |
| 46 | 5 | 5½ | 34 | 33½ | 99 | 5 | 7 | 35½ | 35½ |
| 47 | 5 | 5½ | 33½ | 33 | 100 | 5 | 7 | 33 | 32½ |
| 48 | 5 | 5½ | 33 | 32½ | 101 | 5 | 7 | 35½ | 35½ |
| 49 | 5 | 5½ | 34 | 33½ | 102 | 5 | 7 | 34 | 33½ |
| 50 | 5 | 5½ | 33½ | 33½ | 103 | 5 | 7 | 36½ | 36½ |
| 51 | 5 | 5½ | 34½ | 32½ | 104 | 5 | 7 | 33 | 32½ |
| 52 | 5 | 5½ | 33½ | 31½ | 105 | 5 | 7 | 39 | 38½ |
| 53 | 5 | 5½ | 34 | 33 | 106 | 5 | 7 | 36 | 36½ |
| 54 | 5 | 5½ | 35½ | 34½ | 107 | 5 | 7 | 34½ | 33 |
| 55 | 5 | 5½ | 33½ | 32 | 108 | 5 | 7 | 38½ | 36½ |
| 56 | 5 | 5½ | 37½ | 37½ | 109 | 5 | 7½ | 34 | 33½ |
| 57 | 5 | 5½ | 33½ | 33½ | 110 | 5 | 7½ | 34½ | 32½ |
| 58 | 5 | 5½ | 36½ | 36½ | 111 | 5 | 7½ | 36½ | 36½ |
| 59 | 5 | 5½ | 34½ | 34½ | 112 | 5 | 7½ | 38½ | 38½ |
| 60 | 5 | 5½ | 36½ | 35½ | 113 | 5 | 7½ | 36½ | 36 |
| 61 | 5 | 6 | 34½ | 34½ | 114 | 5 | 7½ | 34½ | 34½ |
| 62 | 5 | 6 | 35½ | 35 | 115 | 5 | 7½ | 35 | 35 |
| 63 | 5 | 6 | 35½ | 34½ | 116 | 5 | 7½ | 34½ | 34½ |
| 64 | 5 | 6 | 34½ | 34 | 117 | 5 | 7½ | 34½ | 33½ |
| 65 | 5 | 6 | 33½ | 33 | 118 | 5 | 7½ | 34½ | 33½ |
| 66 | 5 | 6 | 35½ | 35½ | 119 | 5 | 7½ | 35½ | 35½ |
| 67 | 5 | 6 | 33 | 32½ | 120 | 5 | 7½ | 36½ | 36½ |
| 68 | 5 | 6 | 33½ | 33 | 121 | 5 | 7½ | 34 | 33½ |
| 69 | 5 | 6 | 34 | 33½ | 122 | 5 | 8 | 34½ | 33½ |
| 70 | 5 | 6 | 34½ | 34 | 123 | 5 | 8 | 38½ | 38½ |
| 71 | 5 | 6 | 33½ | 33 | 124 | 5 | 8 | 34 | 33½ |
| 72 | 5 | 6½ | 37½ | 38 | 125 | 5 | 8 | 36½ | 36½ |
| 73 | 5 | 6½ | 34½ | 33 | 126 | 5 | 8½ | 35½ | 35 |
| 74 | 5 | 6½ | 37½ | 38 | 127 | 5 | 8½ | 36 | 35½ |
| 75 | 5 | 6½ | 35½ | 34½ | 128 | 5 | 8½ | 39 | 38½ |
| 76 | 5 | 6½ | 35 | 33½ | 129 | 5 | 8½ | 34½ | 34 |
| 77 | 5 | 6½ | 35½ | 35½ | 130 | 5 | 8½ | 35½ | 35 |
| 78 | 5 | 6½ | 36½ | 36½ | 131 | 5 | 8½ | 34 | 33½ |
| 79 | 5 | 6½ | 34½ | 34 | 132 | 5 | 9½ | 34½ | 33½ |
| 80 | 5 | 6½ | 34½ | 34½ | 133 | 5 | 9½ | 34 | 33½ |
| 81 | 5 | 6½ | 34½ | 32½ | 134 | 5 | 9½ | 34½ | 34 |
| 82 | 5 | 6½ | 35½ | 34 | 135 | 5 | 10 | 35½ | 34½ |
| 83 | 5 | 6½ | 35 | 34½ | 136 | 5 | 10½ | 41½ | 42 |

Average, 34.92 horizontally; 34.33 obliquely; difference, .59.

The chest measurement of the 60 men under 5-ft. 6-in. averages horizontally, 34.45; obliquely, 33.75; difference, .7. (Fig. 1.)

The chest measurement of the 76 men over 5-ft. 6-in. averages horizontally, 35.3; obliquely, 34.77; difference, .53. (Fig. 2.)

The chest measurement of the 15 men under 5-ft. 5-in. averages horizontally 34.33; obliquely, 33.83; difference, 1 inch.

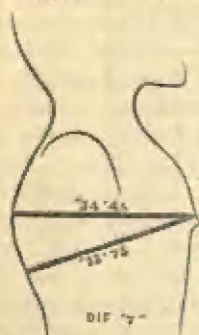


FIG. 1.

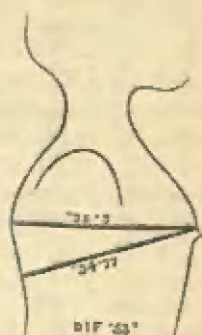


FIG. 2.

DISCUSSION.

MR. HYDE CLARKE remarked that these anthropological observations were of practical and useful bearing. He had checked Col. Fox's figures, and found these fully supported his statements. In the lowest class the difference of measurement reached 2 inches and 2½ inches. In the next there were ten cases of 1 inch, two of 1½ inch, one of 1½ inch, two of 1½ inch, and one of 1½ inch. He trusted that the President would follow up these inquiries. Of course, many recruits will improve; but then it will probably be found that this proportion will be less in those of lower standard.

A paper "On Molecules and Potential Life," by Rev. Dunbar I. Heath, M.A., *Treasurer*, A.I., was read by the author.

Mr. Brabrook read the following paper:—

ON A PREHISTORIC ROAD, DUNCAN'S FLOW, BALLYALBANAGH, CO. ANTRIM. By G. H. KINAHAN, Esq., M.R.I.A., &c. [With woodcuts.]

DURING a short stay in the co. Antrim, my attention was called by J. Wyley, Esq., of Drumadarragh House, to an unrecorded ancient roadway that for centuries has been buried under an accumulation of peat, and only in recent years has been discovered while cutting turf. The bog called Duncan's Flow, in which this road or *cash* (*casán*, a path), is buried, is situated near the west boundary of the townland of Ballyalbanagh, co. Antrim (Ordnance Survey Map, sheet 39), and about four miles north of the small town called Ballyclare.

In the country hereabouts are the sites of numerous prehistoric structures, such as Liss, Moats, Carns, Gallaun, &c. To the north of Duncan's Flow, about a mile and a half, are the remains of what seems to have been a considerable settlement, consisting of larks or earth-caves, the site of a mill and dam, and an old church; while on Wee Collin, the hill immediately north of the bog, are the sites of several forts—one at least must have been of considerable size—while farther northward, north of the Glenwhirry river, moats and other forts existed. To the south of the valley of Duncan's Flow were observed two carns that contained kistveans, with urns and ashes, a large moat called Dunamoy, numerous forts—the largest, called Granny's Fort, or Lisnashee, immediately south of the bog—and other structures, which seem to point to the place having been of considerable note at one time. From the north termination of the cash, or road, there seems to be the track of an ancient road leading toward the large fort on the west slope of Wee Collin, while to the south it terminated at a crag of rock protruding into the bog, said to be the site of a fort, but of which, however, there is now no trace. The cash seems to have been constructed in a straight line between these points, but now the centre portion bows slightly towards the west—probably due to the tendency of the bog to move down stream.

At the present time we find in the centre of the bog about five feet of "flow bog," under which are the roadway and deal corks (roots), that lie on four feet of black turf, that has oak sticks and corks at its base. In the Irish bogs,* but especially in the centre, south, and west of the island, the lowland or "red bogs" consist of a "clearing," or non-turf-producing portion; white turf; brown turf with deal corks and sticks at base; and black turf with oak corks and sticks at base. Usually there is no deal timber associated with the oak; in Duncan's Flow, however, there are some, but very few. These have been calculated to represent the following years of time:† Growth and decay of the oak forest, about 300 years; a foot of black turf, 400 years; growth and decay of the deal forest, 300 years; a foot of brown turf, 200 years; to which we may add, a foot of white turf and clearing, on an average, 100 years. In Duncan's Flow we find the roadway on the black turf,—on the same horizon as the deal forest. It is seven feet wide, and was formed of round oak longitudinal beams covered with transverse planking, or slabs of split oak. In the centre of the bog there were eight longitudinal beams (see fig. 1), but in the north and

* "Peat Bogs," *Quarterly Journal of Science*, July, 1874, p. 294 *et seq.*, by the writer of this notice.

† "Peat Bogs," p. 300 *et seq.*

south portions there are only three, one in the centre and one at each side (see fig. 2); the great number in the centre evidently having been used to bridge over a soft portion, while in



FIG. 1.

the firmer ground, near the margin of the bog, they were unnecessary. Three sections of the road were exposed when the bog was visited, and in that to the south, one of the longitudinal

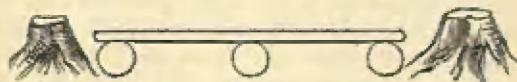


FIG. 2.

beams was found to be deal timber. This roadway evidently was formed prior to the deal-forest age, as none of the associated deal corks occur under it, but all are on the same horizon. The oak timber to form the road probably was procured from the neighbouring upland, as on such situations they are known to have existed during and subsequent to the deal-forest age.* The road probably was used as long as the deal forest existed, and during its occupation, holes in the oak sheeting were mended with deal slabs placed across them (see fig. 3). After the four

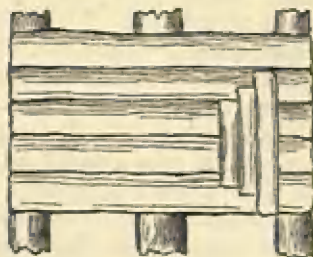


FIG. 3.

feet of lower peat had accumulated, which then represented at least sixteen feet in thickness, the climate must have changed for the place to drain and stop the growth of the peat, thus forming a surface, on which the deal trees grow; or it may have been drained artificially. Probably both were at work, as it appears likely, when the road was formed, some drainage also was accomplished, to keep surplus water away. That nature also was at work seems suggested, as not only here, but also universally in Ireland, deal forests sprang up on the red bogs

* "Peat Bogs," p. 297.

about this time. The road seems to have been abandoned and the deal forest destroyed at about the same time, which appears due to flooding, as the peat above both is "Flow bog" (Ulster), or "Monagay" (Munster)—that is, peat full of sedge and flaggers, which only grows and accumulates in marshes or flooded bogs. On the roadway there are now five feet of uncut turf, while ten feet of "good turf" are said to have been cut away. This, however, probably was not all brown turf; we may therefore suppose that ten out of the fifteen were brown, and the remaining five white turf. There now only remains the thickness of the clearing to be calculated. From what now remains this would appear to have been thin, as scarcely a foot of clearing is on the present banks, which would not represent more than two feet of undisturbed normal clearing. We must, however, remember that "bog stuff" is extensively used for farm purposes, and that probably at least half the original clearing has been carted away. If, therefore, we allow this, we would have about four feet of clearing, which is not excessive compared with the usual thickness general on all the lowland or red bogs. These different figures give us sufficient data to make an approximate calculation as to the time the cash was first constructed, also the number of years since the oak forest began to grow.

| | YEARS. |
|---|--------|
| 7. Clearing, four feet } at 100 years a foot . . . | 900 |
| 6. White turf, five feet } . . . | 2000 |
| 5. Brown turf, ten feet, at 200 years a foot . . . | 2000 |
| 4. Growth and decay of the deal forest, including } about | 300 |
| 3. The time allowed for a change in the climate } . . . | 1600 |
| 2. Black turf, four feet, at 400 years a foot . . . | 300 |
| 1. Growth and decay of the oak forest, about . . . | 5100 |

According to these figures, which are considered by some as a very low estimate, the "oak-forest age" was about 5,000 years ago, while the "deal-forest age" was about 2,000 years later, leaving the roadway or cash over 3,000 years old.

On the floors of, and the roads into, crannoges, we usually find cut reeds, ferns, or heather, sand, clay, or some such; but this roadway seems to have been swept clean, and the bog to have grown on the planking. In the bog, however, the following have been found—as I have been informed by Mr. J. Wilson, a farmer in the vicinity—near the south end of the cash: a stone hatchet, very large horns of a cow or ox, and four sticks like "walking staffs;" near the centre of the road-

way, where fig. 1 was taken, a shoe, in shape like a weaver's shuttle. It probably belonged to a woman or small man, "it was near twelve inches long, and very narrow;" also a carved block of wood, which seemed to represent the head and shoulders of a man of ordinary size.

Other submerged roadways already recorded in Ireland are as follow:—A roadway constructed somewhat similar to an American corderoy, in the bog between the old castle of the Oconnings (corrupted into Castle Connel) and the esker called Goig, co. Limerick. This road was under about twelve feet of "good peat," or at least 2,500 years old. It was made of round oak, but a few feet above the "deal-forest" corks.—"Mem. Geol. Survey Ireland." Explanation of sheet 134.

A roadway in the bog margining Loughnahinch, cos. Tipperary and King's. This evidently was made for the convenience of a crannoge in the lake, but its age is unknown.—*Dublin Quarterly Journal of Science*, vol. vi. p. 69.

A roadway in the "North flats" (reclaimed land), Wexford estuary. This ran south from Begerin Island to Great Island. It was constructed of oak longitudinal beams, supported on two rows of oak piles.—"Jour. Roy. His. and Arch. Ass., Ireland," vol. ii. (4th series) p. 435.

The PRESIDENT and Mr. RUDLER offered some remarks, and the meeting then separated.

ANTHROPOLOGICAL MISCELLANEA.

THE EASTER ISLANDERS.

THE following account has been extracted from an abbreviated translation of Dr. Philippi's work on Easter Island,* by Mr. Edwyn Reed, F.L.S. (Local Secretary for Chili). It relates principally to the present condition of the islanders, and appears to be derived from official reports by Captain Gana, of the Chilian navy, who visited the island in 1870 (two years after Capt. Pocock, in H.M.S. "Topaze"), and Père Eyraud, one of the earlier missionaries.†—J. PARK HARRISON.

The exact distance of Easter Island from the coast of Chili has been ascertained to be 2,030 miles, and it is 1,040 miles from Pitcairn's Island.

The very small number of species of plants shows that it can never have formed part of a great continent. All its indigenous plants appear to have arrived by accident, excepting, perhaps, the *torromiro*, which, however, Dr. Hooker would probably consider to be a simple variety of the New Zealand *Edwardsia microphylla*.

Most of the men are naked; yet they wear a kind of crown, some two inches thick, made of grass, round which they stick feathers of the frigate bird. Others make headdresses of seagulls' plumes. A few wear capes that come down to the knee. The women wear wide hats made of rushes. A piece of cloth‡ or matting, some six feet long, forms their dress, to which is added another piece round the loins, and a third on the shoulders.

The houses of the Easter Islanders are shaped like overturned canoes, or rather pirogues, which appears to support the tradition that the earlier inhabitants arrived by sea, and that their boats, dragged on shore and overturned, were the first habitations. Existing boats are only from eighteen to twenty feet in length, with the bow and stem slightly carved or scratched with figures. They are very narrow, and would not serve for long voyages. The pieces of wood of which they are formed are some of them two or three feet long by four or five inches wide, fastened together with sinnet.

The natives fight with stones, but sometimes use clubs, and a kind of spear or lance, about six feet long, with a flint (obsidian) head. They are very dexterous in plaiting and weaving, making nets and ribbands of the fibres of the *bobahú*. They are also very fond of sewing and carving. In the Santiago Museum there is a shell (*Cypræa maritima*) so well carved in wood that a European

* Printed in Spanish at Santiago in the autumn of 1873.

† Other particulars are given by Dr. Palmer, in the Journals of the Royal Geographical Society for 1870, and Ethnological Society for 1869.

‡ Made from the *bobahú*.

sculptor could not make a better copy. The natives count well, and have a name for each number. Their year is lunar, and they are much interested in the movements of the heavenly bodies.

Captain Gana reports that "the religious belief of the Easter Islanders was vague and unsettled. They practised no external adoration, yet they had priests, and many gods; amongst others the God of War, of Thieving, of Harvest, of Love, and of Good. The little wooden images, called *modomiro* (miro signifying "wood"), were revered but not worshipped." Their priests being all dead or carried away by the Peruvians, the Roman Catholic missionaries found the task of conversion easier than it would otherwise have been. The native priesthood appears to have been hereditary in certain families.

Tablets or small boards, with hieroglyphics and figures of animals not existing in Easter Island, are stated by Père Eyraud to have been met with in all the houses. Captain Gana saw three only. This is the only island of Polynesia where such precious documents have been found.

The disproportion between the number of men and women was remarked both by Cook and La Pérouse. But they thought it might be explained by the women concealing themselves in the huts. It is, however, said by Captain Gana to be really very great. He informs us that only one-third of the inhabitants are women, and that owing to this the girls are married at ten years old. The only marriage ceremony was a feast. Marriages between relations are unknown; and young girls live apart from the rest of the family until married. The wife is rarely allowed the honour of dining with her husband.

Suicides are frequent. This is attributed to the belief that the soul becomes divine, and enjoys perpetual happiness. Corpses are placed upon a heap of stones, with the heads towards the sea.

The Easter Islanders used to eat human flesh, but no one will now confess that he has done so. The bones were taken to Utuitu. Only captives taken in war were eaten.

Though there was but one king in Easter Island, cruel wars and fights frequently occurred, owing to personal feuds and covetousness. They fought at close quarters, and the vanquished became slaves of the victor, who took possession of all their goods and chattels, including wives and children.

Families own the land on which they reside, and cultivate as much of it as is required.

The language is a dialect very similar to that of New Zealand, as regards its harsh pronunciation and gutturals.

There are two traditions of the origin of the islanders—one, that a king arrived from Rapaite (or Oparo), who made all the stone statues. The other (related by Capt. Gana) is as follows:—Two large vessels, without sails, high at the prow and stern, arrived at Easter Island, with four hundred men, under the command of King Tocuyo. He disembarked at Anaquena, and shortly afterwards divided the land amongst his followers.

Since then the kings, who have succeeded him by right of primogeniture, are—Inumike, Vakai, Marama, Roa, Mitiake, Utuiti, Inucura, Mira, Oturaga, Inu, Iku, Ikukana, Ineujaja, Tukuitu, Aumoamana, Tupuirike, Mataibi, Terakay, Raimokaki, Gobara, Tepito, and Gregorio,* the last offshoot of the royal family of Easter Island, comprising twenty-two generations in all. It was the custom for the king of the island to abdicate on the marriage of his eldest son, but then he was not allowed to marry early. The king was considered a divinity, and had absolute power over life and property. His person was sacred, and no one might touch him. His hair was never cut. He received tribute in the form of food and labour. Next in rank there was a chief whose functions appear to have been purely military. This chief was elected annually.

M. Eyraud, on his arrival in the island (in 1863), found 1,800 inhabitants.† In 1868 there were 930, but in 1870 only 600 remained. This great diminution is said to be chiefly owing to the introduction of the small-pox by the survivors who were sent back from the Guano Islands after their deportation by the Peruvians. It is to be feared that the whole race will speedily die out. The surgeon of the Chilian expedition reports that he found, from an examination of a large number of the natives, that the greater part of them have a scrofulous constitution. The head is large, low, and wide; nose regular and extended; eyes dark and expressive, a little oblique; lips rather thick, but the mouth well formed; teeth firm, large, and white; feet and hands small and well-proportioned; the skin bronzed; hair stiff and black; beard slight and of the same colour; joints salient; facial angle 75° ; thorax weak, long, narrow, and flattened; sunk under the clavicles; and the blade-bones prominent and more than usually separated. The circumference of the thorax, 30 inches; stature, 5 feet $2\frac{1}{4}$ inches; pulse, from 76 to 84; respiration, 23 to 27; and the heat of the body, 96° F.

Great mortality in the island is caused by the development of scrofulous diseases in the children, and of tuberculous phthisis in the adults. Early marriages have a great influence in the production of pulmonary disease. The girls are married when scarcely ten years old, long before the system is sufficiently developed; their children are, consequently, weak and unhealthy.

In 1872, the French man-of-war "Flore" visited Easter Island. One of the officers, M. Julien Viaud, has published his diary, and given a description of the island, accompanied with sketches. An extract appeared in the *Globus* (vol. xxiii. No. 5, July, 1873), from which it appears that the French found only one European on the island (a Dane, named Schmid), who had been sent there from Tahiti to plant sweet potatoes. Cats and rabbits (only recently introduced) had multiplied so much that the natives gladly sold them to the sailors for a needle apiece.

The object of the French expedition was to procure some of the

* A child, since dead.

† See note, *infra*.

great stone statues for the Louvre, and an officer with five sailors landed for that purpose. All the inhabitants assisted, dancing and singing, and making a great uproar. In about an hour the work was completed, and the statues lay broken on the ground. "We chose one," says M. Viaud, "that will figure at the Louvre amongst the giants of the East."*

The principal antiquities taken to Chili in the "O'Higgins," Captain Gana's corvette, were the following:—

1. A statue, or moa, 5 feet high.
2. A sculptured block of stone.
3. Another block, 14 inches long, 9 inches wide, and 5 inches thick. The most striking features in this sculpture are the transverse ornaments on the tips of the ears, and a profusion of marks, which Dr. Philippi considers to be "juni."
4. A sculptured head, 10 inches long by 4½ inches wide.
5. A small double image, made out of a white stone, covered with a black pigment, except the pupils of the eyes, where the pigment is removed.†
6. A stone head, or mask, 12½ inches long by 11 inches wide.
7. A carved slab of stone, 5 feet 10 inches long, and 4 feet 6 inches wide, with "herronias," or bird-headed men in *alto relievo*.
- 8 and 9. Two small wooden figures, one male, the other female, the latter with a beard.

THE NATIVE RACES OF THE PACIFIC STATES OF NORTH AMERICA.

By H. H. BANCROFT. Vol. ii. London: Longmans, Green, and Co., 1875.

THE second volume of this important work is in no respect inferior, either in interest or execution, to the first. It treats of the civilised or semi-civilised nations of North America, viz. the Nahuas (including in succession Aztecs, Toltecs, &c.), to the south-west of the Gulf of Mexico, and the Mayas, Quichés, &c., to the south-east.

There are two introductory chapters, in the first of which the author reviews the various definitions of savagism and civilisation, and gives his own views on the subject. The principal point dwelt on is the necessity of association as a primal condition of progress, whence the corollary that there would have been no civilisation without towns. In the second chapter a general view is taken of the above-named nations; but the all-important question of the origin of civilisation, &c., in America is deferred, to be discussed in a future volume. "No theory on these questions could be of any practical value in the elucidation of the subject, save one that should stand out among the rest so pre-eminently well-founded as to be generally

* It appears, from Admiral Lapelin's report in the "Revue Maritime" (vol. xxxiv., p. 106), that the head only of one of the larger statues was taken by the "Flora" to France. The population, in Jan., 1872, as estimated by the French, was 275. Some of the islanders, however, are now resident in Tahiti.—J. P. H.

† In Fiji, in public ceremonials, fans are used with double figures as handles.

accepted among scientific men." And this, the author believes, is not at present the case with any.

Seventeen chapters are devoted to the government, social condition, religion, education, commerce, war customs, arts and manufactures, and hieroglyphic records of the Nahuas. The remaining six chapters give a brief account of the Mayas, less information having been preserved concerning them. The civilised nations of Nicaragua are included in this last division, "though one, at least, of them, was of Nahuatl blood and language."

There are several illustrations of considerable interest, viz. an Aztec cycle; pictorial representations of the Aztec year and the Aztec month; and a calendar stone. Also, on p. 539, a specimen of picture-writing from the "Codex Mendoza," which describes the industrial education of Aztec children of both sexes; small circles indicate their ages. Plates are also given of the pictorial records of Aztec migrations which have appeared in less accessible works. That from the Boturini collection is especially interesting; in this painting not only the number of years are given that were spent in the migration, but the years themselves are named in a way explained in the text. The starting-point, Mr. Bancroft thinks, "was probably either on the lakes of Anáhuac, or in the south, beyond what is now the Isthmus of Tehuantepec."

Though there are ample references, the notes in this volume are less copious than in vol. i.; which some readers will consider an advantage, as avoiding repetition.

J. P. H.

THE MIND OF MAN; *Being a Natural System of Mental Philosophy.*
By ALFRED SMEE, F.R.S., &c., &c. Illustrated with engravings.
London: G. Bell & Sons. 1875.

In the work before us mental philosophy is surveyed from a standpoint somewhat different to that from which we have been accustomed to view it. To this, albeit, we offer no objection, as we believe that observing human nature under various phases is eminently calculated to promote our obtaining a correct knowledge of it in the end. The name of Mr. Smeë, as an able and accurate student and expounder of nature, is not new to us, and his masterly work on "Instinct and Reason," published some years ago, led us to form high expectations of the present production, in which we have not been disappointed.

As regards the general plan of the book, he tells us in the preface that, "after much consideration, and the bestowal of intense and concentrated thought over a long period, I developed my natural system of mental philosophy, wherein the laws of mental action were attempted to be ascertained by a consideration of the structure and functions of the brain, the nerves, and of the organs of sensation, on the one hand, and by a study of the laws of electricity, on the other" (Pref. p. viii.). These principles have been already set

forth in different treatises well known to the public, and the substance of the above-named works has been incorporated in the present volume, which thus comprises, either in detail or as general principles, nearly everything which the author has written on the subject. (Pref. p. ix.)

The opening chapter treats on 'elementary ideas,' embracing the subject of sensations of different kinds, and of the impressions and feelings derived from them. In chapter ii. are discussed 'ideas originating in the mind itself,' wherein the writer treats on the question of instinct, and of ideas of various kinds, including those of modes of human action and of thought, of infinity, of God, of heaven, and of hell. 'Consciousness' is next treated of, after which we have a chapter devoted to the perplexing and often discussed, but no less interesting topic of "the will, and laws of human action." Mr. Smee expresses an opinion (p. 32) that "different persons are affected in various degrees by the effects of pleasure and pain. In some the immediate impression is more active, in which case they are called impulsive. In some the fear of the future is more active, when they are called timid."

A very valuable chapter, and one deserving of attentive study, follows 'on education, and the faculties of man at different periods of life.' Sound and practical hints respecting the conduct of education will here be found, whatever we may think of the author's fundamental theory. His observations, based as they are on intimate knowledge of the structure and mode of operation of the mind, should command earnest study. Following this chapter is one on the "discipline of the mind," in which he very correctly urges the importance of using every organ, and enforces a truth too often lost sight of, that "the different powers of mind should be subordinate one to another; each should have its proper influence; none should be in the ascendancy; for if there be any variation in the relative position of any of the faculties of man, difficulties may arise. Every part of the mind should be brought into regular exercise, that each may attain an equal strength, and none attain to an ascendancy to the detriment of the rest" (p. 45).

A chapter is devoted to the 'Origin of the Human Mind,' which he traces to "the physical structure of the human body, called the brain" (p. 46). He then discusses the extent of animal intelligence, but considers that "the mind of man is incomparably superior to any other living creature" (*ib.*); a fact which some modern psychologists appear to question, while certain human animals occasionally adopt proceedings calculated to throw doubt on this theory! The existence of a soul is not, however, denied in the present work, although the author, as we have seen, considers the mind only as the result of organisation. He subsequently, however, lays it down that the idea which the mind entertains of a soul is that of "a personal individuality, which we are forced to believe has an infinite existence" (p. 53).

Another chapter of some length is appropriated to the question of the 'Government of Mankind,' in which the important influences

of pleasure and pain, as regulating action, are considered. And in a very elaborate one, the subject of 'Words and Language' is amply debated. 'The Relation of Mind to God,' and 'Relation of the Mind to Religious Thought,' are topics that occupy two other chapters, which are followed by one on the 'Relation of the Mind to Moral Philosophy.' The influence of faith, and the question of fallacies, form separate topics for discussion.

In the chapter on the 'Theory of Mental Action' (chap. xv.) he argues, according to his principle of reducing every operation to electrical influence, that the mechanism of the organs of sensation is voltaic. Descriptions of a number of experiments are afforded in support of this theory, with commentaries upon each of them, and which will be read with interest by scientific inquirers, even though they may not carry conviction with them as regards the main principle contended for. According to the writer's theory, "man is made up of a great number of voltaic elements, so arranged as to form one whole. Hence, as the whole modifies the action of every single part, it follows that every idea existing in his brain modifies his action in any particular case" (p. 182). In accordance with this doctrine, the principles of the human mind are laid down in a number of axioms, amounting to sixty-eight in the whole. "Man," he tells us, "acts by electricity, which is set in motion through the muscular structures, whereby contraction ensues, and parts of the body are moved" (p. 187).

The work concludes with a chapter on the 'Voltaic Mechanism of the Nervous System,' in which Mr. Smee contends that the nervous system consists of a voltaic current. All batteries in animal bodies, he says, are compound batteries, one battery being in the body, the other in the brain. The work is illustrated by a number of elaborate and carefully prepared diagrams, which greatly assist in the comprehension of the various theories propounded. In addition to this, there is a very full and well-arranged index, composed, we are told, by the author's daughter, which adds essentially to the value of a book of this class, and the want of which renders many imperfect, and detracts much from their utility. As a whole, the present production of Mr. Smee is one of much interest, and of real value. Independent of the theories propounded by the author, his conclusions appear to be many of them sound, and all of them deserving of attentive consideration. The writer is a man who has consulted nature assiduously, and is an earnest searcher after truth. His work must consequently possess a merit which every real student of the subject of man will be able to appreciate; and it is in no respect the less entitled to consideration, from the circumstance that the author has had the courage to wander from the beaten track, and to think, and to propound theories, for himself; a fact which, in the eyes of many, will much enhance the value of this production, and must, at any rate, add substantially to the interest with which, by every man of scientific attainments, it cannot fail to be perused.

G. H.

ANTHROPOLOGICAL NOTES AND QUERIES.—The President of the Anthropological Institute, having caused to be forwarded to the Governors of Colonies copies of this work, has received replies from many of them, and, in most cases, promises of help in obtaining the information asked for. Among those who have favourably responded to Colonel Fox's appeal, may be mentioned the Governors of Newfoundland, South Australia, Cape Town, Fiji, Ceylon, Singapore, Mauritius, Jamaica, Antigua, Bahamas, Barbadoes, and the Gold Coast. Governor Musgrave, of South Australia, has distributed numbers of copies to magistrates, inspectors of police, and others who are brought into contact with natives.

ARCTIC ETHNOLOGY.—The papers recently prepared for the Arctic Expedition by the Royal Geographical Society are arranged in two groups—one relating to Geography, the other to Ethnology. The latter section includes a series of papers on the 'Greenland Eskimos,' by Mr. Clements Markham; an essay on the 'Descent of the Eskimo,' by Dr. Rink; a paper on the 'Western Eskimo,' by Dr. Simpson; and, finally, the 'Report of the Anthropological Institute.' A copy of the volume has been presented to the Library.

PORTUGUESE DOCUMENT.—A photo-lithograph of a letter, preserved in the Torre do Tombo at Lisbon, has been presented to the Institute by the Secretary of the Portuguese Legation. It refers to the death of Vasco de Gama, and to a projected expedition in search of gold. The expedition should start in September for Malacca, and thence make a voyage to Timor or Ende, and winter in the islands. Inquiries would there be instituted about the occurrence of the precious metal, and an attempt would then be made to discover the happy island of gold. The letter is written by E. M. L. Godinho de Eredia, but the name of the person to whom it was addressed is unknown.

SOCIÉTÉ KHÉDIVIALE DE GÉOGRAPHIE.—Under this name a society has just been founded at Cairo. Its object is to study geography in all its branches, but especially to throw light on those parts of Africa which are still unexplored, or but little known. The inaugural address was delivered on June 2nd, by the President, Dr. G. Schweinfurth, and a copy of this discourse has been sent to the Library of the Institute.

BRITISH ASSOCIATION.—The next meeting of the Association will be held at Bristol, commencing on Wednesday, August 25th. Section D (Biology) will be presided over by Dr. Selater, and the Anthropological Department of this section will be placed under Professor Rolleston. Members of the Institute intending to contribute memoirs should send them, if possible, by August 1st, addressed to the General Secretaries, British Association, 22, Albemarle Street, W.



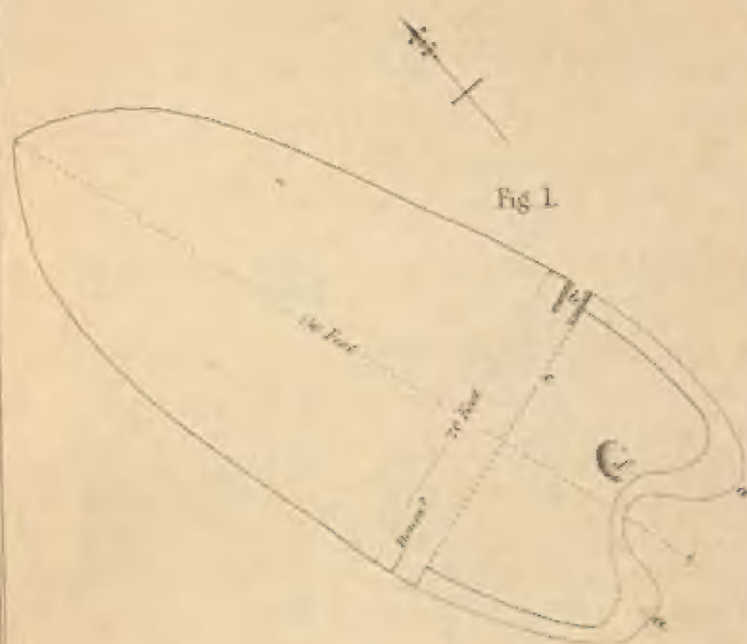


Fig 2.



LONG BARROW, "SWELL I"

FIG. 1. GROUND PLAN. FIG. 2. PENANNULAR CHAMBER.

THE JOURNAL
OF THE
ANTHROPOLOGICAL INSTITUTE
OF
GREAT BRITAIN AND IRELAND.

APRIL 13TH, 1875.

Colonel A. LANE FOX, *President, in the Chair.*

The minutes of the previous meeting were read and confirmed.

The following new members were announced:—The Hon. Lady HAMILTON GORDON, 50, Queen's Gate Gardens; Lady MAUDE PARRY, 7, Cranley Place, Onslow Square; Lady CLAUD HAMILTON, 19, Eaton Square; ARTHUR GAVED PHILLIPS, Esq., Cressington Park, near Aigburth, Liverpool; and JOHN D. LOVERDO, Esq., 7, Powis Gardens, W.

The following presents were announced, and the thanks of the meeting voted to the respective donors.

FOR THE LIBRARY.

- From the AUTHOR.—*Researches in Prehistoric and Protohistoric Comparative Philology, &c.* By Hyde Clarke.
 - From the EDITOR.—*Cosmos*, di Guido Cora. Vol. II. No. 6.
 - From the EDITOR.—*Materiaux pour l'Histoire Primitive et Naturelle de l'Homme.* Vol. V. Nos. 11 and 12.
 - From the AUTHOR.—*Langue Basque et Langues Finnoises.* By Prince L. Lucien Bonaparte.
 - From the SOCIETY.—*Jahrbuch der K. K. Geologischen Reichsanstalt.* Vol. XXIV. No. 4. *Verhandlungen*, ditto, Nos. 16 to 18, 1874.
 - From the SOCIETY.—*Mittheilungen der Anthropologischen Gesellschaft in Wien.* Band IV. No. 10.
 - From the SOCIETY.—*Proceedings of the Royal Geographical Society.* Vol. XIX. No. 3.
 - From the SOCIETY.—*Transactions of the Society of Biblical Archaeology.*
- VOL. V.

- From the AUTHOR.—Cave Hunting: Researches on the Evidence of Caves. By W. Boyd Dawkins, M.A., F.R.S.
- From the AUTHOR.—Briefe aus der libyschen Wüste. By Karl A. Zittler.
- From the EDITOR.—Archiv für Anthropologie. Nos. 3 and 4, 1875.
- From the AUTHOR.—The Testimony of the Mounds. By T. E. Pickett.
- From the AMSTERDAM ACADEMY OF SCIENCES.—Verslagen en Mededeelingen, Afd. Natuurk. Deel. VIII; Jaarboek, 1873; Process-Verbaal, 1873-4.
- From the EDITOR.—Revue Scientifique. Nos. 39, 40, and 41, 1875.
- From the AUTHOR.—Anniversary Address, Geological Society of London, 1875. By John Evans, F.R.S., President.
- From JAMES BURNS, Esq.—Researches in the Phenomena of Spiritualism. By William Crookes, F.R.S. Miracles and Modern Spiritualism. By A. R. Wallace.
- From the EDITOR.—Nature (to date).

Mr. BERTRAM F. HARTSHORNE exhibited and described objects of Prehellenic age, from Hissarlik, the site of Homer's Troy; also ashes from the tomb of the Greeks and Trojans at Akshi Kioi, or Thymbra, Plain of Troy.

DISCUSSION.

The PRESIDENT, speaking of the *θεὰ γλαυκῶπις Ἀθήνη* of Dr. Schliemann, said he ventured no opinion as to whether these words signified an owl-faced or a bright-eyed god. He felt convinced, however, from an examination of representations on the vases which Dr. Schliemann had figured in his book, that the figures were not intended to represent the face of an owl, but were simply the hasty representation of a human face, rudely depicted. The transitions from the realistic representation of a human face might, he thought, be clearly traced. With respect to the so-called stone idols with the human, or, as Dr. Schliemann supposed, owl, face upon them, he thought that they were evidently stone models of the vases, similar to those stone models which, in Egyptian graves, were put in to represent the vases which contained the viscera of the mummies.

ON the PEOPLE of the LONG BARROW PERIOD. By GEORGE ROLLESTON, M.D., F.R.S., Linacre Professor of Anatomy and Physiology, Oxford. [With Plates IV., V., and VI.]

Introductory Remarks.—In this paper I propose to give in detail a description of the examination of three Long Barrows situated near the little village of Nether Swell, in the county of Gloucester, prefacing this account by some general remarks—firstly, as to the physical characteristics of the people of the Long Barrow period; secondly, as to the possibility of

dividing that period into successive epochs; and thirdly, as to the rationale of the various modes of disposing of the dead observable in those early tumuli. In these prefatory remarks I shall not confine myself to the facts observed in the Gloucestershire explorations, but shall use, for purposes of comparison, my records of the investigation of similar barrows carried on by me in Yorkshire and elsewhere, with the valuable assistance of Canon Greenwell.

Looking at the osteological remains as a whole, perhaps the most striking point is the great disproportion in the sizes and the lengths of certain of the long bones, and, by consequence, in heights, of the male and female skeletons respectively. The male skeletons were very ordinarily about 5 feet 6 inches in height, as against a height of but 4 feet 10 inches attained to by the female. The average difference between the statures of males and females in civilised races is about half this amount, whilst a precisely similar disproportion is observable at the present day between the stature of individuals of the two sexes amongst savages.* The clavicles show the disproportionate smallness of the females even more strikingly than the bones

* The late Sir Andrew Smith, K.C.B., informed me, that from extensive observations, carried on for a period of seventeen years, in South Africa, he could assure me that the Amakosa Kaffirs to the eastward of the colony averaged near 5 feet 8½ inches, women 5 feet ½ inch. (See "*Archæologia*," 1870, vol. xlii. p. 457, where I put this observation, and a number of other measurements bearing upon this point, on record.) Gustav Fritsch, in his work, "*Die Eingeborenen Süd Afrikas*," s. 17, gives 171·8 cm. (5 feet 7½ inches) as the average stature of men of that race of Kaffirs just mentioned, and at p. 24 he says of the females: "*Pflegen die weiblichen Individuen in der Entwicklung den männlichen nachstehen was wohl in der unterdrückten politischen Stellung der Frauen seinen Grund hat*;" but he does not give their exact stature. At p. 216 this author says, "*Die Frauen der Ora-herero erscheinen in gleicher Weise wie der übrigen Süd Afrikanischen Nigritier in Vergleich mit den Männern unbedeutend*," and at p. 277 he gives 160·4 cm. (5 feet 3 inches) for the average stature of ten male Hottentots, as against 144·2 (4 feet 8 inches) for the average attained from measuring four females of the same tribe. When, however, the stature of the male members of a race falls as low as that just given for the female Hottentot, the stature and other dimensions of the sexes appear to be nearly identical. This is the case with the Bushmen (see p. 398, *i.e.*). The measurements, however, given by Weisbach in the Anthropological part of the "*Reise von Novara*," 1867, p. 216, do not show that the discrepancy between the stature of the sexes of savage races rises in a direct proportion with their savagery, the greatest difference put there upon record being that between Java men, 1679 mm., and Java women, 1461·2, and amounting to 8½ inches, whilst the difference recorded between Australian men and Australian women is only 65 mm. (2½ inches). A similar disproportion, and one even greater than that recorded by Weisbach for the Javanese males and females, has been reported to me, as the rule amongst the Japanese; whilst, on the other hand, a "*Report on the Aborigines of Victoria*," 1859, p. 45 (*cit.* Davis, "*Thesaurus Craniorum*," p. 364), gives 5 feet 6 inches as the average height of eleven Australian men, as against 4 feet 10½ inches of an Australian woman. (See, however, Davis, "*Phil. Trans.*" for 1868, p. 524.) The honourable position assigned to, or obtained by, the female sex amongst the Germanic races may be considered as testified to by the near approach to equality in stature

already alluded to. Professor Busk has recorded the small size and delicate form of the clavicles from the Gibraltar caves.*

To the relative size of the skulls in the two sexes in prehistoric times, the doctrine laid down by Retzius in 1845,† and re-affirmed in 1854 by Hüsckke,‡ as to the upper and lower classes of modern society, and the civilised and uncivilised races of modern days, is ordinarily supposed to apply, *mutatis mutandis*. Broca, in his interesting paper on the "Caverne de l'Homme Mort," says§: "L'un des traits les plus remarquables de la série de l'Homme Mort, c'est la grande capacité relative du crâne des femmes." The head of the female occupants of this cavern, like the head of the rustic Dalecarlian females, as observed upon by Retzius, was but little—some 99·50 cub. cent. (6 cubic inches)—inferior in capacity to that of their male fellow Troglodytes, whilst the difference between the modern Frenchman of Paris and the modern Frenchwoman is more than twice as great as this amount. Where a woman is told by symbols, no less than by precepts, as Tacitus tells us,|| the German women were told, *venire æ laborum periculatorumque sociam, idem in pace idem in prælio passuram ansuramque*, it is easy to understand, upon the principle of natural selection, how an equality, or, at least, a near approach to equality, in the physical, as well as in the moral and mental character of the sexes, may come to prevail, and how the weight and stature of the entire body in the female sex may approximate to the proportion of the male sex. Such, however, is rarely the case in savage tribes and times, and what we usually find, both among modern savages, as testified to by Weisbach,¶ and amongst prehistoric men, as I have found, is an exaggeration in the females of the disproportion which exists, even in civilised races, between their brain and their entire body weight, to the disfavour of the latter, which is relatively heavier in the other sex.

which, even in ancient times (see "Smith's Dictionary of Geog.," Art. 'Germania') was observed to exist between the sexes. Liharz, however, most surely underestimates the difference when, in part following Quetelet and Bednär, he gives, in his great work, "Das Gesetz des Wachstumes," p. 4, Taf. i., ii., iii., iv., 175 cent. (69·899 inches) as the average male stature, and 173 cent. (67·111 inches) as the average female stature. The rationale of all this lies in the earlier attainment of puberty by the female sex in our species, and the consequent early consignment of the females, in savage varieties of it, to child-bearing and hard labour. Mr. Dobson's paper on the "Andamans and Andamanese," published in the preceding number of the Journal of this Institute, p. 457, furnishes a good illustration of this principle. (See especially Plate xxxi.)

* "Trans. Internat. Congress Prehist. Archaeology," 1869, p. 158.

† "Müller's Arch.," 1845, p. 89.

‡ Schädel, "Hirn. und Seele," p. 48.

§ "Revue d'Anthropologie," ii. 1, p. 45, 1873; and "Bull. Soc. Anth.," Paris, Tom. viii. ser. ii. p. 832, 1874.

|| "Germania," 18.

¶ "Reise der Novara," 1867, 'Anthrop. Theil,' s. 222.

Without going into the familiar statistics which tell us that the brain attains very nearly its full weight at a very early age, I will just add that the average circumference of the head is shown by Liharzig* to be but about an inch less in either sex at the age of 14 than it is in adult life, the measurements being 54 as against 57 centimetres for the male, and 52·5 as against 55·5 for the female sex. Now, when the differences in treatment and mode of life, which have already been alluded to as accounting for the disproportion in the size of the entire body, observable among certain savages of either sex, do exist, they do not come into play ordinarily till after the age of 14, when the skull and its contents are incomparably nearer to their full size than the weight and size of the body are to their adult measurements; and it is obvious, therefore, that neither in civilised nor in savage life is there any *à priori* improbability that the brain and skulls of the two sexes should be at least sub-equal, however widely their entire body-weights may differ.

The female skulls labelled "Swell i. a," and "Swell vi. 2, 2," show, by their measurements given below, that some, at least, of the women of the Neolithic period, in Gloucestershire, stood in the same favourable relation of cranial capacity, as to the men of that time, as that which Broca has recorded on behalf of the women of the Caverne de l'Homme Mort, whilst the other bones from these barrows speak to the existence of opposite relations between the trunks and limbs of the two sexes. On the other hand, another female skull, "Swell i. 1, 22-9-1874," presents an inferiority of size as compared with the male skulls and the other female skull found in the same barrow and in its immediate vicinity, which may be expressed more clearly than by its detailed measurements, by saying, that previously to the restoration of the larger female skull, "Swell i. a," this smaller one could be got into its interior. This shows that as great differences might exist in savage races between the skulls of the sexes as Hüsckke and Broca have noted as being usual in civilised times. These latter differences we may be allowed to ascribe to differences in education; the former may, perhaps, be explained by the relatively smaller-sized crania of female savages having belonged to women who, during their early childhood, and whilst their brains were being built up, had been subject to the disadvantages of scanty diet. "Savages," Mr. Bagehot has told us, "are the poorest of the poor;" and in a stone age, devoid of cerealia, scarcity of game, or a murrain among domestic animals, would bring famine alike upon the

* "Das Gesetz des Wachsthumes," Taf. vi. and vi.; which table shows also that the female head is, at 21 months, 48½ centimetres in circumference as against 50 for the male.

families of the chief, with whom, I take it, we have here mainly to deal, and upon their serfs. The same privations, the subjection to which at and after the time of puberty, say 14 years of age, we have suggested as the cause of the disproportionately short stature of the women, would, if they came into play upon the same subjects when at the age of 14 months, or earlier, be competent to stunt the growth of their brains in like ratio. It is, indeed, as the late Professor Phillips once remarked, something to be wondered at, considering the hardships and scanty dietary to which all, or nearly all, wild races of men are more or less subjected, that their skulls and brains should be as large as we find them to be. "Ill-filled" skulls, consequently, to use the expressive epithet employed by Professor Cleland,* are not very rare in series taken from long barrows.

By an "ill-filled" skull, Professor Cleland tells us, he means a skull the exterior surface of which is marked by "a mesial and two lateral ridges on the roof, with flatness of the adjacent surfaces," and which has "its position of greatest breadth high up upon the parietal bones." The mesial carina may, I would add, be prolonged in such skulls over the frontal bone, and the frontal tubera may retain their infant-like prominence. To these peculiarities I would further add the presence of two depressions on the exterior of the skull, corresponding to convexities on its interior surface, as completing in many ancient and modern savage crania the character of "ill-filledness." One of these depressions is well known as the "post-coronal furrow," but inasmuch as the mesial vertical carina often developed in male skulls may be, and often is, continued along the line of the sagittal suture, so as to divide the so-called "furrow" into two parts, this name is not a happy one. The second of these depressions corresponds to a part of the parietal bone which lies a little above its posterior inferior angle, and immediately, therefore, above the part of the bone which is furrowed internally for the lateral sinuses. As in the former case, an inward ingrowth corresponds to the outwardly visible concavity, so that much such an appearance is produced as we can imagine would have resulted from pinching in the skull walls over this area, had they been plastic. I have been able to demonstrate the rationale of these depressions in the following manner:—By removing from a skull, with its brain *in situ*, the greater part of its roof, but leaving of this structure one antero-posteriorly-running arch of bone, corresponding to the sagittal, and two transversely-running half-arches, corresponding respectively to the half of the coronal and the half of the lambdoid sutures on one

* "Phil. Trans.," 1870, vol. 160, p. 148.

side, the exact position of all the main convolutions and fissures of the brain can be shown in their normal relations to these landmarks in the vault of the skull. It will make the matter plainer, and at the same time facilitate the production of similar preparations in other museums, to say that a brain, under such surroundings, presents something of the appearance in the skull which a living head does when subjected to measurement in such a cephalometer as that of M. Antelme.* By means of such a preparation it is easy to show that the post-coronal depression in the roof of the skull does not correspond, as supposed by the late Dr. Thurnam,† to the fissure of Rolando, but to the deep, and often wide, fissure which divides the superior frontal convolution into two well-defined lobes, and abuts upon the ascending frontal convolution, by a terminal bifurcation into two arms of considerable length. This fissure, as is well known, exists, and has often been described and figured in the brains of the anthropomorphous apes, in the crania of which animals the post-coronal depression is sometimes indicated when the sagittal carina is absent. Similarly, the second of the depressions which I have noted as commonly present in the postero-inferior part of the parietals of "ill-filled" skulls, may be seen to correspond to a certain multiradiate fissure frequently noticeable on the posterior or convex aspect of the middle temporo-sphenoidal convolution, but, as far as I know, not named by any of the numerous writers who have followed Gratiolet in describing the convolutions and fissures of the cerebrum.

Professor Bischoff, however, in his well-known paper on "*Die Grosshirnwindungen des Menschen*,"‡ speaks of certain fissures, without any well-defined character, which appear on the boundary between the parietal and occipital lobes, and says that they correspond to a "*fissura occipitalis externa*" which appears in the human *fœtus*, but is normally limited in duration to the seventh and eighth months of intra-uterine life. Though brachycephalic skulls have not, as yet, been proved to have been found in Great Britain in any primary interments in the barrows of which I am writing, and though brachycephalic skulls from the United Kingdom, and, indeed, I am inclined to think, from European countries generally, are ordinarily well- and not "ill-filled" skulls, it may, nevertheless, be allowable to say here that the "brachycephalic

* See "*Mem. Soc. Anthropol. de Paris*," Tom. i. pl. vi. fig. 2.

† "*Nat. Hist. Review*," April 1, 1865, p. 267.

‡ In the "*Abhandlungen der k. Bayer. Akademie der Wiss.*" ii. Class. x. Band ii. Abtheil., 1868, pp. 448, 450, 495; or "*Separat. Abdruck*," pp. 58, 60, 105, and Taf. x. fig. 7.

angustiores," as Professor Cleland would* call the brachycephali of several other parts of the world, frequently present the depressions of which I have been writing. An excellent instance of the postero-parietal inward pinching of the skull-walls was furnished to me quite recently by a Maori skull presented to the University Museum by Dr. Batt, the skull having a latitudinal index of 79, and possessing also markedly the contour which induced Retzius to class the Maoris as "brachycephali."

When we come, however, to compare the Long Barrow people with the still surviving inhabitants of the Southern Sea Islands, a comparison first instituted by Dr. Thurnam,† we must guard ourselves from supposing that "ill-filled" skulls are by any means the rule amongst the ancient British inhabitants of this country, as they are amongst the little favoured indigenes of Australia and Tasmania. Dr. Thurnam's own tables of the capacity of the skulls and the weight of the brains of the modern English and the ancient Briton,‡ which show that the larger quantities characterise the older race, furnish the needful qualification to his above-cited comparison. To this I would add, that in none of the Long Barrow skulls which I have had the opportunity of measuring has the altitudinal index been found to be lower than the latitudinal; and that a point of degradation, therefore, has been found wanting in this series which Professor Busk has observed to exist in some priscean dolichocephalic skulls, and in Tasmanian and Bushman crania amongst those of modern savages.§ The same facts may be expressed in another way by saying the "Sion Typus"|| of His and Rüttimeyer, a type which Rüttimeyer¶ has spoken of as characterised by "Kräftigkeit und Würde," is by no means sparsely represented in the Long Barrow series, the larger female skulls corresponding very closely with the description given by those anthropologists of that type, whilst many of the male skulls, in which the smoothly-swelling globose outlines and rounded-off contours of the female skulls are replaced by muscular ridges, vertical carinæ, and foreheads sloping in correlation with heavy lower jaws, might be taken as fair, if not precisely accurate, representatives of the Hohberg type which is so closely allied to it.

A few pathological and teralogical peculiarities will be noticed

* See "Phil. Trans.," 1870, p. 148. † "Mem. Soc. Anth.," Lond., iii. p. 24.
‡ *I. c.*, vol. i. pp. 55 and 57.

§ See "Journal Ethn. Soc.," London, Jan., 1871, p. 467.

|| For a description of the several types of prehistoric crania, as given by His and Rüttimeyer, see their "Crania Helvetica," 1864; or Huxley on "Prehistoric Remains of Caithness," p. 103, seqq. 1866.

¶ "Jahrbuch der Schweizer. Alpen." for 1864, p. 393.

in the detailed account to be given below. It is interesting to note, that in no case have the wisdom teeth been observed to have come through previously to the ossification of the spheno-occipital synchondrosis. This is the reverse of what has been observed in certain savage races, ancient and modern, by M. Broca.* Perhaps the pastoral habits of these tribes may account for their conformity in this particular to what is usual in civilised races, a diet of milk, cheese, and flesh causing less injury to the teeth, and being less likely to call the wisdom teeth prematurely into use than one in which vegetable food forms a large factor. The bones of animals found in these barrows were, it may be noted, and again contrary to expectation, those of domestic breeds almost, or quite invariably.†

As regards the age of the Long Barrows, there is no doubt that, whatever other traces of the presence of man may be found in these islands, they are the earliest sepulchral evidence of his existence here. The huge cubical bulk of some of these tumuli is an *a priori* argument for their antiquity. Pristine or priscan man, like the modern savage, grudged no labour less than that which was spent on piling up a huge burial mound. My friend Mr. H. N. Moseley, naturalist on H.M.S. "Challenger," in recording his observations on the Kudang tribe of Australians living near Cape York, tells me that though they are destitute of almost everything in the way of property, having neither perforated stones to help them to dig roots—as have the Bushmen—nor boomerangs, nor tomahawks, nor any shaped stone implements, nor canoes; living, not on the available wallabies and phalangiers, but on fish, reptiles, invertebrata, and vegetables; having the scantiest clothing, and sometimes, even in the cases of adults, none at all; being, finally, below savagery, as understood by a good judge of it‡—Professor Nilsson—in having no chiefs; they nevertheless take great pains with the burial of their dead, marking out and adorning the graves with posts, and decorating them with the bones of the dugong. It is true that the Long Barrow people can be proved to have been in a higher state of civilisation than are these miserable Kudangs, by the purely quantitative considerations—firstly, that their barrows are so large as they are, and, secondly, that they contain so few skeletons.

But when a small number of individuals can get large structures erected for their lodgment, either when dead or alive, the society in which they have lived, or are living, has attained some elevation, however low, in the road leading upwards from sheer

* "Revue d' Anthrop." ii. 1, p. 21, 1873.

† *Per contra*, in a pit within the British port at Cissbury, *Bos primigenius* and wild-boar bones were found.

‡ Nilsson's "Early Inhabitants of Scandinavia," ed. Lubbock, p. 167.

barbarism. On the other hand, the poet of a civilised age, catching, as a poet sometimes does,* the essential features of early times with a singular, or even a scientific, accuracy, writes of a prehistoric funeral thus—

Ergo instauramus Polydoro funus, et ingens
Aggeritur tumulo tellus †—

whilst, at the same time, his friend Horace, and their common patron Mæcenas,‡ could utter their injunctions, and sympathise with the wishes expressed in the lines—

Absint inani funere nunciae,
Luctusque turpes et querimonie
Compece clamorem, et sepulchri
Mitte supervacuos honores.§

Considerations of less generality, but not, perhaps, less convincing as regards the early date of the Long Barrows, are drawn from the facts, that in none of them in Great Britain has any metal implement been found, at least in connection with a primary interment; that tanged and barbed arrow-heads are similarly wanting in these tumuli, so far as Great Britain is concerned, though they have been found in such structures both in Denmark and in Brittany;|| thirdly, that when they do contain burnt bones, those burnt bones are never found in urns; and, fourthly, that a very much larger proportion of the bones from these tumuli present the manganic oxide discolouration, so characteristic of antiquity, than has been observed in the series of bones from any other ancient burial places.

If it is easy and safe to speak of the Long Barrows *en masse* as being undoubtedly the oldest sepulchral monuments with which we are acquainted, much difficulty and danger attaches to any attempt at dividing the Long Barrow period into different epochs. If we know, as we do know on irrefragable evidence,¶ that two modes of disposing of the dead so diametrically different as inhumation and cremation have been practised

* See, in illustration of this, Wordsworth's lines, near the end of the eleventh book of the "Prelude;" or Tennyson's lines describing the condition of Britain in the interval between the evacuation of it by the Romans and the establishment of a new order of things.—"Idylls of the King. The Coming of Arthur," line 6, *segg.*

† Vergil's "Æneid," iii. 62.

‡ The line, "Nec tumulum euro, sepelit natura relictos," ascribed to Mæcenas by Seneca, Ep. 92, justifies us in thinking that Horace, in the lines quoted in the text, was not merely reproducing the epitaph of Ennius—

"Nemo me lacrymis decoret nec funera fletu
Faxit Cur? volito vivu' per ora virum."

§ Hor. Od. ii. 21—24.

|| See Thurnam "Ancient British Barrows," "Archæologia," vol. xlii. pp. 24 and 71, separate publication.

¶ See "Archæologia," xlii. p. 434.

contemporaneously, and by the same people, on the same area, it is impossible, it may be thought, to lay weight on any differences in sepulchral details for proving differences of date. Again, it may be urged, and should be borne in mind, that, in a country intersected by woods and water as Great Britain was in, and long after, the period we are dealing with, tribes living at what we now consider but short distances from each other, might be practically quite isolated, and develope thus entirely independent manners and customs. And, thirdly, though Diodorus Siculus has told us* that peace ordinarily prevailed between the multitudinous kings and chiefs in this island, we may set our knowledge of the condition of things, as to war and peace, prevailing among savages of the present day against this statement. I have been informed by the Rev. W. G. Lawes, who was for many years a missionary in Savage (Niue) Island, that he found that very few of the natives had ever been more than two or three miles from the place they were born in, the condition of blood-feuds which prevailed between the various septs and clans rendering it unsafe to do so. Analogous accounts are given to us by Australian travellers, and enable us to understand that very complete separation of one tribe from another may be compatible with this living in the immediate neighbourhood of, and contemporaneously with, each other. On the other hand, it is not impossible that the arrangements noted in some Long Barrows may indicate an approximation towards the practices characteristic of the Round Barrow period, and may, consequently, be considered as denoting that these barrows belonged to a later age than others in which no such arrangements have been detected. The great and cardinal difference observable between Long Barrows lies in their containing burnt or buried bodies. The immense majority of the Long Barrows in the south of England were erected for inhumation, whilst exactly the reverse of this has been the rule in the Northern Counties.

We will begin by asking whether there is any reason for supposing that the builders of these two kinds of Barrows, separated thus in space, were also separated in point of time? Some weight, though not much, may be laid upon the fact that cremation was, in Great Britain at least, the rule during the bronze age, as it is possible to suppose that the practice of cremation was borrowed by the people of the latter part of the stone age from the strangers who introduced them to the use of metal. A survey, however, of the records of the "*Steingraber*" of Scandinavia, Denmark, Schleswig-Holstein, and North Germany, such as is given by Weinhold in his "*Toten-Bestattung*,"

* "*Biblioth. Hist.*," v. 21.

1859; or in the 24th Bericht of the Schleswig-Holstein-Lauenburg "Gesellschaft für Alterthümer" for 1864, will not suggest that time rather than, or even in co-operation with, severance in locality, has had anything to do, necessarily, with the causation of this difference. Dr. Anderson,* however, appears to think that, in the long cairns of Caithness, burial may have preceded cremation; and it seems likely that the short cairns, whilst affined to the Round Barrows by this character of shortness, were at once later in date than, and yet genealogically connected with, the long cairns. And in the short cairns cremation was the rule. Some fragments of pottery, with a thong-pattern, closely similar to, or identical with, that so familiar to us from the round barrows, were found by me in a cremation long barrow near Market Weighton, in the East Riding of Yorkshire; and the same may be said of some pottery found with leaf-shaped arrow-heads, by Dr. Anderson, in a short cairn in Caithness. This may seem to give some stronger ground for supposing the cremation barrows to have been later in date than the other. Very similarly patterned pottery, however, is figured by Dr. Thurnam from a chambered long barrow at West Kennet, Wiltshire,† and its presence there would, of course, invalidate any argument which its presence in a cremation barrow might have tempted us to draw. That presence, however, in the Wiltshire barrow is supposed by Dr. Thurnam‡ to have been due to a subsequent intrusion into, or occupation of, this chambered barrow by the metal-using Belgæ. But the fact that much pottery, elegantly marked and delicately made, albeit not lathe-turned, has been found in Continental barrows of the stone period,§ may make us think Dr. Thurnam's suspicion somewhat unreasonable, and, if we do think it so, the argument from the presence of such pottery in the cremation long barrow in the East Riding falls to the ground.¶

If it is unsafe to suppose it to be anything more than a probability that the practice of cremation may be considered to mark a later, and the practice of inhumation an earlier, epoch in the

* "Proc. Soc. Ant. Scot.," June, 1868, p. 508.

† "Cran. Brit.," Pl. 50, p. 3.

‡ "Archæologia," xlii. p. 72.

§ See Weinhold, &c.

¶ As it is but a few years since it was currently held that no pottery was to be found in the long barrows, at all events of the north of England, it may be well to say that a coarse, particoloured pottery, containing large fragments of pounded pebbles and shells, which we may suppose to have been manufactured for domestic purposes, is very abundantly represented by shards in the long barrows both of the north and south of England. Pottery of similar paste, but rolled into finger-shaped masses, was found in some abundance in a long barrow (Sweet I.) in Gloucestershire. Similar pieces of pottery, used in the manufacture of other *stettia*, have been shown me by Sir Henry Dryden, Bart., from ancient structures in Brittany.

Long Barrow period, there is still less reason for suggesting that the unchambered long barrows were anything but contemporaneous with the chambered. But a question may arise as to whether those long barrows in which the receptacle for the dead took the shape of a closed "cist," without any passage or gallery leading to the exterior, as in the chambered barrows, may not, as being more nearly approximated in shape to the cists in the round barrows of later times, have been also nearer to them in point of date. The Long Barrow in which the closed cist has taken the place of the galleried chamber is by no means so common as either the chambered barrow, or the unchambered, used for inhumation, or the cremation long barrow. A very competent antiquary* has expressed himself to me as doubting whether *true* cists are ever found as the primary places for interment in such barrows. Several instances, however, have been put on record in which there seems to be much reason for accepting the description of the existence of such cists so placed. The account of the exploration of the Littleton Drew Long Barrow, successively by Sir Richard Colt Hoare and by G. P. Scrope, Esq., M.P., given in the description of Pl. 24 of the "*Crania Britannica*"; and that of the exploration of the tumulus at Charlton Abbots, given by L. Winterbotham, Esq., in the "*Proceedings of the Society of Antiquaries*," April 19, 1866, appear to me to give trustworthy histories of such discoveries; and other examples may be found in Dr. Thurnam's paper on 'Long Barrows' in the "*Archæologia*" for 1869.

Weinhold† divides the Hünenberge into two classes, accordingly as they contain "cists," or chambers with galleries.‡ In a long barrow, "Swell vi.," I found what appeared to me to have been a closed cist, containing a considerable number of human remains, and also the skeleton of a dog, as will be related at length further on. This receptacle had been much disturbed, and I shall not, therefore, lay any weight upon the presence, a short distance above it, of some fragments of finer, thong-marked pottery than I have seen from any other long barrow; still, some traces of a passage or gallery leading to it would, I think, have been discovered if they had existed. The bones from this, as also from another somewhat similarly dilapidated sepulchre in the same barrow, had less of the man-ganic oxide discolouration than was observable upon bones from the galleried chambers in this district; and though this may be

* So Nilsson, *l. c.* p. 166, says, "Every tomb had its side gallery."

† *l. c.* p. 6.

‡ So Engelhardt, in his "Catalogue of the Antiquities in the Copenhagen Museum," speaking of the "Grabkammer of the stone age," says it "hat bisweilen einen niedrigern bedeckten Steingang" (p. 9, ed. 1872).

explained as being due to some chemical difference in the soil, it is also possible that it may indicate a lesser antiquity in the bones so affected, as compared with the others.

On the whole, I am inclined to think that indications are not wanting which suggest to us that inhumation will ultimately be shown to have been the earliest mode of burial practised in these, as yet the earliest of known sepulchres; that inhumation in galleried chambers was probably the earliest variety practised, at least where the necessary slabs for the construction of such chambers and passages were available; but that burial without burning, and also without any cist or chamber whatever, may, in other districts not so conditioned, have been contemporaneous with burial in chambers; and finally, that inhumation in cists without passages leading down to them, and cremation, mark later epochs in the Long Barrow period. The questions are in need of further evidence for their definite solution, and they are beset with numerous difficulties and sources of fallacy.

* Coming, in the third place, to a consideration of the modes of burial observable in long barrows, and the rationale to be given of them, I have to say that one peculiarity appears to me to characterise all long barrows, whether they contain burnt or unburnt bodies, and that this peculiarity is, that whether the number of bodies be large or small, they occupy but a relatively small part of the entire tumulus. In other words, the bony remains, burnt or unburnt, are huddled together in short compass, whilst, so far as we see on the first contemplation of their arrangement, they might have been disposed with little or no more trouble at intervals throughout the tumulus. A segment or two of the entire length of the barrow has been employed for the reception, all the rest has been erected for the honour of the dead. In a long barrow near Market Weighton, containing some twenty-six burnt skeletons, the whole number were found within a distance of 60 feet from its east end; of these twenty-six, twenty-one were buried in a segment of 32 feet in length, and of these twenty-one, seventeen lay in a length of 17 feet. In another barrow, also of the cremation variety, near Kirkby Stephen, and 179 feet in length, the whole number of burnt bodies amounted only to seven, but they were crowded into a segment of the barrow which was but 3 feet 6 inches wide and 12 feet 6 inches in length. A chamber 7 feet by 4 feet, in one of the Gloucestershire barrows, "Swell vii.," contained, even after having been exposed to rifling by the rustics of the neighbourhood during a period of many years, remnants of no less than nine adult skeletons. Another receptacle which I examined in another barrow ("Swell vi.") close by, and which I believe to have been a cist, though,

from its having been disturbed, it is a little unsafe to speak quite positively, contained within a space of 5 feet 6 inches by 4 feet, parts of two adult unburnt skeletons, male and female respectively, parts of three children about 7 or 8 years of age, and the skeleton of a dog buried with the woman's skeleton; whilst a similar receptacle in the same barrow, examined by Canon Greenwell, contained parts of no less than ten human skeletons, all but one of which had belonged to adults, packed together within an irregularly-shaped space (for which see plan), which was 8 feet 6 inches long, and 4 feet broad at one end and 3 feet at the other. When these crowded masses of bones are looked at *in situ*, they strike the observer as having certain sets amongst them left in their natural relations and juxtapositions, whilst certain other bones have been somehow dislocated away from their normal connections. The upper cervical vertebræ, for example, I find myself to have noted as retaining, in many cases, their position of approximation to the lower jaw and the base of the skull; the same is recorded occasionally of a larger or smaller number of the dorsal and lumbar vertebræ, and of the patellæ in their relations to the tibiæ and femora, whilst portions of the pelvis, of the feet, of the humerus, and of the scapular arch, may also be found all close together. It may be well to give here an extract from the notes taken of part of the excavation carried out in a cremation Long Barrow near Kirkby Stephen, in Westmoreland:—

“Monday, Aug. 24, 1874.—Two strong adult men were represented, within a circle of 1 foot 6 inches diameter, by portions of their lower jaws, of their skulls, of their second cervical vertebræ, and of their scapulæ. A fragment of an occipital bone was seen looking upwards, with the proximal end of a right humerus on one side of it, and the distal of a left one on the other, and portions of an atlas also in relation with it. But fragments proving the presence of two odontoid vertebræ, and shortly afterwards of two lower jaws, were found close by, as also an os calcis and an astragalus, which last were less than an inch from a clavicle, whilst, finally, a number of vertebræ were found in apposition, and parts of two scapulæ were in relation with the head.” In the case of a third skeleton, out of the seven found in this barrow, a patella, the only one found in the entire set was found in apposition with the proximal end of a tibia. In the cases of the bones whence evidence was drawn for the presence of four other burnt skeletons in this large barrow, it seemed from their condition of arrangement, or rather disarrangement, that they must have been disarticulated before they were burnt.

The plan employed for burning bodies in the cremation long barrows examined by me, with the help of Canon Greenwell, as also in others examined by him previously and independently, was that of packing the bodies—whether fresh or dried, whether still in continuity, or disarticulated, along the central axis of the barrow—together with wood and stones. The combustible and transpirable mass thus formed reached half, or much less than half, the entire length of the barrow. It was bounded and supported on either side by the lateral masses of the barrow, in which, in some barrows, a system of flues for favouring draught appears to have been provided by the mode adopted for arranging the large stones of which they were made up, and which, in other barrows, appear to have been made up of turfs which would serve as non-conductors by abutting upon the central combustible strip. In the barrow near Market Weighton the turfs must have been arched over the central strip, thereby greatly favouring calcination, as in a kiln, whilst externally they were supported by lines of stone rubble, which kept them in place. This short description is sufficient, perhaps, to convince the reader of what examinations, lasting many days, convinced the writer was the case—viz. that whatever was done in a cremation barrow with more or few skeletons, was done at one time, once and for all.

There have been three theories put forward to account for the facts observed as to the human remains found in Long Barrows. The first of these may be called the Successive Interments Theory. It is expounded by Professor Nilsson,* who however, deals only with non-cremation, galleried tumuli. Now the very *raison d'être* of a gallery is the facilitation of successive interments; but the construction of a cremation barrow is incompatible with such an object. The second of these theories may be called the Ossuary Theory; and this, though combated by Professor Nilsson, is not incompatible with his own theory, and, indeed, as regards chambered barrows, ought to have that theory combined with it. There is much evidence in its favour, as regards every variety of long barrow.

The third theory may be called the Human Sacrifice Theory, for which much evidence may be adduced from the practices of other nations, but for which the remains, as far as I have been able to judge, from British barrows do not furnish any proof.

In my account of one of the long barrows (Swell vii.), I shall describe how a skeleton was found lying upon the remains of two others, which had undergone some disturbance when the first was put in; and there is no need to labour a proof of the

* *L. c.* pp. 167, 168.

statement that the wish* of one man to be laid in the same tomb with another, his friend or his patron, is a *vera causa* for successive interments. But if the arrangement of the bones, the existence of the passages or galleries, and the feelings of human affection, as embodied in literature, and detectable, also, in ourselves, all alike speak in favour of the practice of successive interments, evidence of an equally cogent character can be brought forward to show that bodies were stored as they fell in by the death of their owners, and then buried or burnt simultaneously. The description of the structure of a cremation barrow proves the point of simultaneity, but till the theory of human sacrifice be disposed of, the acceptance of the ossuary theory cannot be held to be necessitated. Dr. Thurnam was the principal advocate of the theory† which accounted for a multiplicity of skeletons, of different sexes and ages, being found aggregated together in these barrows, by supposing that the majority of them were the skeletons of slaves or captives, slain to keep the chief company on his journey to, and in his sojourn in, the other world. That such rites were practised by the ancients, that even in the time of Homer they were looked upon as repugnant to the moral sense of mankind,‡ but that they retained vitality enough to give birth to the even worse atrocity of gladiatorial shows, we have evidence in abundance to show. But we have no evidence to show that the bones of the slaughtered victims were allowed a place in the same cist, chamber, or urn, with those of the great man in whose honour they had been massacred. Achilles, indeed, gives precise

* This wish was expressed by the prophet of Bethel in the simple injunction, "Lay my bones by his bones" (1 Kings xiii. 31), and is put into the mouth of Patroclus by Homer (Iliad, xxiii. 83, 84), in the beautiful lines—

Μη ἰμά σῶν ἀπάνευθε ταῖς μαιναὶ δασία Ἀχιλλεύῳ
 Ἀλλ' ὁμοῦ, ὡς ἐτραῖον ἔνδον ἐνταφίσαι δόμοισι.

The imagery of the 32nd chapter of Ezekiel is borrowed from his recollection of successive interments.

† See "Mem. Anthropol. Soc.," Lond., vol. i., or pp. 28 & 68 of separate publication; "Crania Britannica," pl. v., l., lviii., lix.; "Archæological Journal," vol. xxii., June, 1865; "Archæologia," xxxviii. p. 413, xlii. p. 25, seqq. 1869. In this latter place Dr. Thurnam has collected a large number of passages from ancient and modern writers, in illustration of the practice of immolating victims at funerals. To these passages I would add one from Tertullian, "De Spectaculis," xii.—"Olim quoniam animas defunctorum humano sanguine propitiari creditum est captivos vel mali status servos mercati in exequiis immolabant. Postea placuit impietatem voluptati adumbrare. Itaque quos paraverant armis quibus tunc et qualiter poterant eruditos tantum ut occidi discerent; mox edito die inferiarum apud tumulos erogabant. Ita mortem homicidiis consolabantur."

‡ See "Il.," xxiii. 176.

injunctions* as to keeping the bones of Patroclus separate and apart from those of the twelve Trojan youths, the two dogs, and the four horses, slain and burnt with his body. Sometimes we find human bones scattered here and there, not only on the surface, but deep down in the mass of barrows, and I have thought that such bones, when this presence cannot be accounted for by any secondary and shallower interment, or any disturbance of a primary one, might perhaps have been parts of the skeletons of such victims. There is, however, a wide difference between leaving the remains of slaughtered victims lying about on the surface of the ground, and placing them inside a sepulchre, and the former of these modes of treatment is, I submit, the more natural one, and the more likely to have been adopted, for many reasons. The bones of a wife or concubine, who may voluntarily or half voluntarily† have given up her life at her master's funeral, may have been allowed to lie with his; but this supposition would not explain the facts of the numbers, and of the presence of both men and women in varying proportions in these interments.

Dr. Thurnam, however, based his support of the human sacrifice theory, not merely upon literary evidence, but also upon the appearances which the bones themselves from these barrows presented. Some of these bones are in the Oxford University Museum, viz. those from Ebberston,‡ referred to as being calculated to "convince the most incredulous;" and others in the Cambridge University Museum I have been, by the kindness of Professor Humphry allowed to inspect and examine. I have to say that, after repeated and careful examination of these bones, with the assistance of skilled anatomists, I am entirely convinced that they do not fairly bear the interpretation which Dr. Thurnam has put upon them. The "perfectly sharp and clean" edges of the broken bones, and the "porcellaneous character" of the fragments themselves, I happened one day to see reproduced by an accidental breakage which occurred in one of the skull-bones from the Market Weighton long barrow, and my eyes were opened to the necessity of no longer taking the theory in question for granted. On further examination, and after repeatedly submitting the Ebb-

* Οστία Πατρόκλου Μενετιάδου λεγόμενα
 Εὐ διαγιγνώσκοντες, ἀριφραδέα δὲ τίτοκται
 'Εν μίσση, γὰρ κείνῳ πορῶ, τοὶ δ' ἄλλοι ἀκύνθην
 'Εσχάτῃσι καίοντ' ἱππῖμιξ ἄνθρωποι τε καὶ ἄνδρες.
 Καὶ τὰ μὲν ἐν χροστῇ φάσιν καὶ δίπλαισι δημῶ.
 Οἰόμεν.—Π, xxiii. 299.

† See Anderson, "Proc. Soc. Ant. Scot.," May 13, 1872, p. 524.

‡ "Mem. Soc. Anth.," London, *i. e.*

erston series, of which Dr. Thurnam wrote, *i. c.*, to the inspection of others in whose judgment I had confidence, I was compelled to give the theory up.

What has compelled me to the acceptance of the Ossuary theory, is, firstly, its all but absolute indispensability for the explanation of the appearances met with in cremation Long Barrows; secondly, the fact that, in many receptacles for unburnt bodies, the arrangement which those bodies present is not that which they would have if they had been, one after the other, disturbed to make room for fresh immigrants; thirdly, the fact that the practice of storing bodies in provisional receptacles, *en attendant* a final sepulture, is one which has been practised all over the world; and, fourthly, a consideration of the circumstances which would be likely to throw a number of corpses upon the hands of a tribe in the Neolithic age, and the difficulties which those very circumstances would put in the way of their disposing of them at once.

The first three points need no further explanation; upon the fourth I will say a few words. At the present day, with all our means and appliances, severe cold produces a high mortality; even in a small village several old people may be sometimes reported to us as being all lying dead within its precincts at one time. If this is the case in modern England, what must have been the case in neolithic Britain? and in the presence of severe frost, and possibly deep snow, how was such a population as a tribe of the Long Barrow period to get rid of its dead out of its sight? I owe a reference which throws much light on these questions to Dr. Joseph Anderson's paper in the "Proceedings of the Society of Antiquaries of Scotland," May 13, 1872, p. 526. This reference is to a passage in King Alfred's version of "Orosius," where we read that it was the custom of the Esthonians to keep the body of anyone who died one month, or even two months, or, in the case of kings, even half a year, before burning it.

In following up this line of illustration, I came upon the following lines relating to the manners and customs of the Russians, and addressed, from Moscow, to Spenser, by a lesser

* So, I think, has been Dr. Engelhardt, who has been quoted in favour of it. His last account of the great Tumulus at Borreby, in the 1872 edition of his "Catalogue of the Danish Antiquarian Museum," runs thus, p. 10:—"43 a. Inhalt einer Steinkammer bei Borreby auf Seeland, welche bis an die Decksteine mit unordentlich durcheinander gemischten Skellettheilen von wenigstens 70 Individuen angefüllt war; mitten im Begräbniss raume fand man mehrere gespaltene, und vom Feuer angebrannte Menschenknochen und auf dem Steinpflaster des Bodens, unter Kohlen und Asche, gebrannte Menschenknochen und das Geweih eines Rehbock's, welches letztere vielleicht vom Opfernale bei der Einweihung der Grabstätte herrührt. Neben den Knochen im Grabe lagen Werkzeuge von Stein und Bein, Perlen und Topfscherben."

poet, one G. Turberville. They may be verified by a reference to "Hakluyt's Voyages," vol. i., ed. 1809, p. 433. Speaking of a Russian winter, Turberville says:—

The bodies eke that disunburied lie they then
Laid up in coffins made of firre, as well the poorest men
As those of greater state. The cause is lightly found,
For that in winter time they cannot come to break the ground.

Returning from comparative civilisation to a consideration of what would be likely to happen in still earlier days, we may say that, out of a number of bodies stored up till it should be possible or convenient to deposit them finally in a tumulus, some would become more, some less, some, perhaps, entirely disjointed; for the practice of stacking or storing the dead, though originated probably by the necessities of cold weather, would be continued, as well recognised principles would lead us to expect, irrespectively of times and seasons, when it was once well established. Thus the partial retention and partial loss of the natural connections of the bones observed in these barrows would both alike receive an explanation, and be seen to depend upon the greater or less resistance which their ligaments had offered to the attacks of putrefaction.*

I will now commence a detailed account of the examination of three Long Barrows, situated near the village of Nether, or

* M. Arthur de la Borderie, Député à l'Assemblée Nationale de France, in his work, "Les Brétons Insulaires et les Anglo-Saxons du v. au vii. Siècle," when giving (p. 622) a translation from "Les Bardes Brétons," relating to the death of Kendalann, puts in italics the following words:—"Son squelette sèche encore au coin du feu." And in commenting upon them says—"Est-ce à dire que les Brétons eussent conservé jusqu' alors le vieil usage, décrit par Strabon, de faire dessécher les os de leurs parents et de les garder dans une coffre au coin du feu domestique?" I have not succeeded in verifying this quotation, which appears to have exceedingly important bearings on the subject of ossuaries, or at least upon that of the practice of keeping the dead body accessible for some time after death, a proceeding which terminates usually in its removal to an ossuary.

The following references to statements as to the use of ossuaries in ancient and modern times may be found useful:—

- Phineas Fletcher, "Eclogues," p. 10, ed. 1771, 12mo.
- G. Turberville, in "Hakluyt's Voyages," vol. i. p. 433, ed. 1809.
- Falkner cit. Cunningham, "Nat. Hist. Straits of Magellan," pp. 146, 147.
- Lukis, "Archæol. Journal," 1845, vol. i.
- Anderson, "Proc. Soc. Ant. Scot.," May 13, 1872, p. 526.
- Nilsson, "Early Inhabitants of Scandinavia," ed. Lubbock, pp. 162, 163.
- Grey, "Journals in North-West and Western Australia," i. 257, 1841.
- Kyre, "Journals in Central Australia," ii. p. 344, 1845.
- Finlayson's "Mission to Siam," p. 235, 1826.
- M. Boye, "Proceedings of Soc. Ant.," Lond., ii. ser. iii., p. 310.
- "Schoolcraft," i. 80, 102.
- D. Wilson, "Prehistoric Man," 1865, p. 488.
- Musters, "Journal Anthropol. Inst.," Lond. i. 2, Oct. 1871, p. 201.
- McDonald, *Ibid.*, p. 214.
- McDonald, *Ibid.*, ii. 2, Oct. 1872, p. 176.
- Lubbock, "Prehistoric Times," ed. 1872, p. 269.
- Wood, "Cruise in South Seas," p. 115, 1875.

Lower Swell, near Stow-on-the-Wold, in the county of Gloucestershire. Three persons, the Rev. David Royce, Canon Greenwell, and myself, were concerned in their examination. A large part of the investigation of the barrow first explored, and hereinafter spoken of as Swell i., was superintended by Mr. Royce alone, in the years 1867 and 1868; and to his report of what he observed in it I am greatly indebted for much of what relates to its structure. To his zeal and intelligence, exercised for a period of no less than eight years, we owe the preservation not only of valuable records of facts, but of many osteological and other relics which might otherwise have been scattered and lost. To Canon Greenwell's suggestions and advice, as well as to his very efficient help in other ways, and notably in the examination of the third barrow (Swell vii.),* at which I was only able to be present on a very few occasions, I owe a large debt.

Swell i. (Pl. iv.).—The first of the three barrows examined is situated in a field which has been under cultivation from 27 to 30 years, though it is still known as the "Cow Common." The other two barrows were found by us in 1874 to have the heart-shaped or "horned" eastward ends, which are so well known to us from Dr. Anderson's† descriptions of the "horned cairns of Caithness," as also from Dr. Thurnam's‡ accounts of the tumuli at Uley and Belas Knap, in this very county of Gloucestershire. There is, as it appears to me, a great probability that the barrow, Swell i., was originally constructed with the same outlines and contour as these other barrows; but the eastward end had been much reduced in size by removal of the stones of which it was made up, to fill up an adjacent quarry, in the years 1867-1868; and in 1874 some indistinct traditions as to the existence in former years of curved walling at that end, were the only main specific basis—as distinct from the general likelihood arising out of its other still remaining points of resemblance to typical horned barrows—for holding that it probably had been one. Making allowances, however, for the demolitions which had taken place in the years 1867 and 1868, and, possibly enough, in years long before them, we shall not be far wrong in saying that the extreme length of the barrow from E.S.E. to W.N.W., the direction of its long axis, was from 150 to 155 feet; and that its breadth at its eastward end

* The three barrows have been numbered Swell i., Swell vi., Swell vii.; the numbers intervening between i. and vi. having been assigned to other barrows not treated of here.

† See Anderson, "Ancient Remains of Caithness." Mem. Soc. Anth. Lond., vol. i. p. 474, 1865. Proc. Soc. Antig. Scotland, 1866-1868.

‡ See Thurnam, "Crania Britannica," Pl. v. Mem. Soc. Anth. Lond., 1865. *Archæologia*, vol. xlii. p. 209.

was 77 feet; at its highest point, a point very near to the line occupied by the chamber which, as will be seen, gives the chief interest to the barrow, 69 feet; and at its westward end, 40 feet. The greatest height of the barrow, as at present existing, is about 5 feet. The ground occupied by the barrow falls slightly from the west eastwards.

In 1867, and previously to the removal of the eastward end, the Rev. David Royce discovered in the barrow a chamber of about 3 feet square, as reported, but probably of even smaller dimensions, with a gallery or passage leading down to it at a point close to its northern boundary line, and 55 feet from its east end. In this chamber were found three skeletons, and in the immediate neighbourhood, either at the same time or in 1874, parts or the whole of five more skeletons, making a total of eight, for whose reception or honour the tumulus had been piled together. The osteological remains, and the surroundings in which they were found, will be described in greater detail further on. The barrow was found to be bounded (irrespective of talus) on its north and south sides by a wall made up of the oolitic flags of the district, laid in horizontal courses; the presence of a wall was not made out at the west, nor, as already stated, at the east end. The wall was about 2 feet 3 inches in height on the south side, but was considerably less on the north, where it was in some places reduced to as few as three or four courses of its constituent flags. The north wall turned inward, to form the passage just mentioned as leading to the skeleton-containing chamber. The walls of the chamber consisted of flagstones of much larger size than those used for forming the boundary walls of the tumulus, the largest being as large as 3 feet 6 inches by 2 feet 4 inches. Some of these stones had been set on edge; some, probably, had served as covering stones. The walls of the chamber thus constituted were set inside the walls of the passage formed by the inward prolongations of the north wall. A reference to the ground plan (Pl. iv. fig. 1) will make these relations clearer. But it will also seem to show that this barrow was broader at the level of the chamber than at that of the extreme eastward end; that, in other words, this barrow was spindle-shaped, instead of being, as is commonly the case in long barrows, club-shaped, or, as in the horned cairns, heart-shaped, with the broader end eastwards. It is true that on measuring the entire mass of talus which the rubble had formed at the east end, the space thus curved was found to be 6 or 7 feet wider than the transverse measurement of the barrow, taken across the chamber. But the plan shows the limitary walls, both north and south, taking a set inwards as they pass eastward from that line. Mr. Royce

has suggested that these portions of the liminary walls do not represent the original boundary walls of the barrow for the 55 feet or so from its eastward end, but that the original outer wall ran along a line more or less continuous with that of the walling to the westward of the chamber, and that it has been removed in some unrecorded denudation of the mound. The more internally placed and still persistent walls might be but layers of stone, arranged by the original builders of the barrow for purposes of self-protection against the slipping and sliding of the rubble; just as we often observed our modern labourers arranging the stones of these barrows while we were exploring them, the same considerations of personal convenience having operated upon neolithic, as they do upon modern, stone-heavers.*

This supposition would remove the stumbling-block constituted by the representation of a long barrow tapering towards its eastward end. The ground plan (Pl. iv. fig. 1), however, represents, in continuous lines, the actual facts, as seen and measured by us; and a plan of a Barrow with a double wall at its east end, such as the Uley Barrow appears to have been,† may represent those facts as they were previously to interference. Our ground plan (Pl. iv. fig. 1) shows this conjectural restoration by dotted lines.‡ The wall of the passage which ran outside the eastward wall of the skeleton-containing chamber, I think, from a comparison of my own notes taken on the spot in 1867 with my observations made in 1874, must originally have been continued southwards as far as the south wall of the barrow, as is indicated by a dotted line in the ground plan. Looking at the barrow in 1867, I noted that a single wall, starting from the south side, "crossed the width of the heap to the opposite side, where the 'cist' was;" and a MS. note of Mr. Royce is to very nearly the same effect, viz. that "there was an appearance of walling in the very centre of the barrow, and almost through it in a line with the east end of the cist; the face of the wall was towards the west, not east." A segment of this wall, about 4 feet long, existed

* This observation of the practice of modern labourers should put us on our guard against assigning too much importance to, or searching too curiously for, a meaning for every line of walling met with in barrows made of slate-shaped stones. As regards the outer boundary walls even, the mere necessities of the case will account for the greater definiteness which they possess at the sides and west ends; though, it is true, they do not account for the peculiar heart-shape which they assume at the east ends of such barrows. For the double curve thus described, the fact that an entrance to a doorway, or gallery, or passage could thus be made with facility, may possibly account. And this contour might, on the well-known principle of "survival," be retained even when, as in the Swell barrows, there was no gallery nor chamber at the east end.

† See "*Crania Britannica*," Pl. v.; "*Archæologia*," xlii. p. 49, *ibique citata*.

‡ Compare Dr. Anderson's Plan, vii., "*Proc. Soc. Ant. Scot.*," l. c.

in 1874, in continuation of the passage wall southwards from the chamber it bounded; and another segment, about 2 feet long, took origin opposite this segment, and was prolonged northwards from the southern wall; but the intervening length, to which the testimony of one of our workmen spoke, as well as my own notes and those of Mr. Royce, had disappeared in 1874. What, however, is certain is, that westward of a line corresponding to the dotted line, *c*, in the ground plan, the barrow was crossed from north to south by a zone or strip, varying in width from 2 feet 8 inches in the region of the chamber to 3 feet 6 inches in the middle line, and differing from all other segments of the entire length of the barrow in the important particular of lodging eight human skeletons. In the chamber contained in this transverse zone were found, in 1867, parts of three skeletons, two being skeletons of adults, and one a skeleton of a child. At the same time a third adult skull was found immediately to the north, and a fourth immediately to the south of the chamber; whilst outside the chamber again, but at a greater distance to the south than the skulls, were found two headless bodies, "one about the centre of the barrow, west of the supposed central walling, and one more to the south-west." The place of this latter skeleton, which was reported to me, in 1867, as having been the skeleton of a woman, is marked in the plan (Pl. iv. fig. 1) by the word "bones"? And the apposition of this note of interrogation, borrowed, like the words given above in inverted commas, from Mr. Royce's notes, make me think that the place assigned to these bones may be a little farther south than it ought to be. Working in 1874 in this transverse zone, we found, at points varying from a spot a little south of the middle line of the barrow, four skeletons, one of an aged woman (described below under label "Swell i., 122, 9, 1874"), one a male skeleton without a head, and two skeletons of children. Portions of the headless skeleton found by us in 1874, fitted with fragments of bones found and given to me by Mr. Royce in 1867; and the later headless skeleton, therefore, may be supposed to be identical with one of the two discovered earlier, which one its discoverers did not think it worth while to remove in its entirety. But what is of consequence is to note, that after a very careful examination of all the bones obtained from the chamber, and from the transverse zone crossing the barrow in the meridian of the chamber in the year 1867 and in the year 1874, we proved that there was no proof in the entire assortment of the existence of more than eight skeletons, three of which had belonged to children, and five to adults. It is well known that many large barrows were erected for the purpose of containing only just such a chamber as the one

found in this one, and for lodging only just as few bodies as—or, indeed, often fewer than—the number found here. But it is also well known that many of these long barrows contained more than one, or even two, sepulchral receptacles, “chambers,” or “cists;” and such an additional receptacle for additional dead may have been constituted by a somewhat enigmatical structure found in 1868, but destroyed before 1874, and represented in fig. 2, Pl. iv., taken from an anastatic drawing of Mr. Royce’s. This structure, when discovered April 10th, 1868, during the process of carting away the eastward end of the barrow, was described as being a “diagonal oval chamber, built of small slates, after the manner of the inclosing outer wall,” and as being 6 feet by 4 feet 8 inches in transverse measurements. As the figure shows, it contained no upright flags, and, as the ground plan shows, it was 25 feet nearer to the east end of the barrow than the chamber already described, and a little to the north of the middle line. When discovered, it contained the following relics: the distal end of the left radius of an adult man; the mid and ungual phalanges of an adult human subject; the clavicle of an infant; the upper molars of an ox; the last lower molar of a sheep; and the phalanx of a small carnivore, probably a weasel, as verified by Professor Owen for Mr. Royce, April 27th, 1868; and two flint flakes. Though the fact of this penannular structure having been so far away from the line of the chamber already described makes it improbable that the two bodies represented by the bones just mentioned could have been of the number of eight found to the west of that line, it is of importance to note that there is no osteological impossibility in the way of considering them to have so belonged to them. But in favour of their independent origin there is an additional fact, in the possession by me of a very much worn human temporal bone, which can scarcely have belonged to any of the five adult skeletons already spoken of, but which came from some part of this barrow, it is uncertain which.

If much is left in comparative uncertainty as to the bones contained in this structure, much more is left in uncertainty as to the interpretation of the structure itself. It is possible that when discovered in 1868 it was even then but the remains of a much larger, or, at least, a more perfect structure; and that larger or more perfect structure may have been either the remains of a heart-shaped or horned east end, or it may have been the remains of a chamber placed much as certain chambers were placed in the chamber-end barrow at Uley, already referred to as described by Dr. Thurnam. But it is also just possible that it may have been simply a stretch of walling erected as a

"block" to shore up the loose rubble, of which the great bulk of the tumulus was made. Similar structures, it should be said, have been used for sepulchres in Scottish tumuli; and if we were to remove the upright flagging from the chamber to be hereafter described (see Pl. v. fig. 3) as found in the third long barrow examined by us at Swell, that chamber would come to be very like the woodcut here annexed. But it is unprofitable to speculate further upon the real meaning of this lost structure. We tread on much surer ground in dealing with the locality in which the eight more or less perfect skeletons were found. The way in which the skeletons, three in number, were found, in 1867, to be arranged within the chamber, itself a space which was reported to me as being but 3 feet square, and which was in all probability of even less size, was described to me with much precision as follows:—There were in the middle the bones of a child; all round the north side of the cist were coiled the bones of one of the two adults, with the vertebrae *in situ*, and the legs protruding through a hole in the cist to the outside of it; whilst in the south-east angle of the cist was the other adult, "sitting up," or, as it was otherwise expressed to me upon another occasion, "squatting," with the head resting on the ribs. The covering stones, the existence of which was not noted, as also some of the side stones, must have got displaced, and the chamber had got filled with rubble.

From the chamber there came also to me, in 1867, the jaws of a very young pig, those of a cub-fox, and a part of the occipital bone of a sheep. Some other bones, of ox and of sheep, were sent with them, and may have their presence referred to the practice of feasting at graves. Bones of oxen and sheep were found in various parts of the barrow to the westward of the transverse ossiferous zone; and some of these bones, from being crumbly in consistence, and, like the human bones from the chamber and its neighbourhood, much stained with the manganic oxide, may be supposed to be of the same age. No other human bones besides those already specified were found in the barrow. Large quantities of ashes and charcoal were found here and there, both at the east and west end of the barrow. The structure, indeed, of the eastward end of the barrow, removed in 1867-1868, was reported to us as having been quite different from that of the west, and this mainly by virtue of a line of deposit of ashes along and on both sides of its centre line. This deposit was said to have consisted of heaps of ashes lying on stones, with stones again laid over them. The heaps of ashes were not in a continuous line, but were, as reported, separated by intervals of 10 feet or so. The ashes themselves were reported as being of a "pinkish, fleshy colour,

not at all like the ashes from turf-burning, and as having no grit in them, as field ashes usually have, but feeling soft and greasy when taken between the thumb and finger." Blacker ashes were also found to the north of the central deposit; and in a deposit from 8 to 10 feet to the north of the central axis were found two serrated flint flakes, stones reddened and calcined, and a splinter of glass. The presence of such an article as this last shows that the eastward end of the barrow must have been subjected to some comparatively recent disturbance—at all events, of a kind which would favour the descent of a fragment of such a modern substance as glass. As far as I could judge from excavations made in 1874, the structure of the barrow was, with the exception of the ossiferous zone, and disregarding accidental disturbances made possibly at very different times, essentially one and the same from one end to the other; the mass of the barrow consisting of slates and rubble arranged in a slant from north and south outer walls respectively, so as to meet in the middle line—as one of the labourers, employed in 1868 in carting them away, expressed it, "like the roof of a house." The slanting stones were supported externally by the boundary walls, similar walling being intercalated here and there internally for the same purpose. The converging slopes of flags and rubble had been broken into here and there in the westward half of the barrow; and in exploring one such interruption of its continuity, about 20 feet to the westward of the skeleton-containing chamber, I came upon a few bones of ox, of ancient date, mixed up with a good deal of blackish earth, amongst the rubble. Mr. Royce found a considerable number of such interruptions of the line of the barrow in its westward half, ashes, and bones of lower animals, being found in them. Some of these interruptions of, or alterations in, the arrangement of the component elements of the barrow, may have been coeval with it; those at the east end may have been later—I am inclined to think very much later—than that period. In this matter Mr. Royce does not agree with me.

There was found in this barrow a considerable quantity of pottery, some of a coarse blackish kind, resembling that obtained by me in considerable quantity from a Long Barrow at Market Weighton, and like that, also, in having been intended for domestic uses; and some of the same black and red paste, but cigar-shaped, and intended, as Sir H. Dryden pointed out to me, for use in pot-making, as in Brittany. The pottery was reported to have come from parts west of the middle of the long axis of the barrow, nearer its north than its south wall, and from no very great distance downwards in it. A coin of

Constantine was found in the same locality, but very near the surface.

It may now be well to put distinctly on record what we personally observed in 1874, whilst making certain sections to clear up points left undecided by what had been done in 1867 and 1868.

In clearing out the space already spoken of as the transverse zone, containing the ossiferous chamber, and that part of it which ran southwards from the chamber, parts or the wholes of four skeletons were come upon. And the first points, perhaps, to be noted about them are that they were not laid upon the natural soil, as has sometimes been observed to be the case—as, for example, in another Long Barrow in this neighbourhood—but that they always had some slaty rubble interposed between them and it, and that two of these bodies lay to the south of the long axis of the barrow. These facts may seem to some to be an argument in favour of Professor Nilsson's view* of the bodies having been introduced at successive periods into such tumuli, and of explaining thus those marks of disturbance which have induced other writers to have recourse to the hypothesis that these ancient, like certain modern savages, used their tumuli as ossuaries. The first body found was that of an aged woman, lying (on the right side?) in the contracted position, with the vertebræ *in situ*, about 4 feet 6 inches from the top of the barrow, and from 2 inches to 4 inches from the natural surface of the ground, which was separated from the skeleton by a layer of stones. In front of the legs of the woman, and quite close to them, was the skeleton of a child, in possession of the full milk dentition. Charcoal lay in small quantities all about the bones of the two human subjects, and mixed up with them were the bones of voles. As the trench was carried up towards the chamber, the bones of another child, considerably younger than the former one, were found scattered about in it; and, finally, in the nearer neighbourhood of the chamber was found a considerable part of a headless male skeleton lying on its right side—as there are indications to prove, from the wear of the bones, irrespective of notes taken or not taken at the time, that nearly all the skeletons from this chamber, and its neighbourhood, were laid. The head of this skeleton, if it was not buried in the headless condition in which we found it, must have lain or been propped against the eastward wall of the zone or trench. The very cramped position which it would thus have occupied may seem to favour the notion of its having been thus headless when first deposited, a notion which the discovery

* "Primitive Inhabitant" of Scandinavia," ed. Lubbock, p. 168.

of heads buried separately in other barrows* might, in the absence of other considerations, serve to confirm. The patella, tibia, and fibula were *in situ*, as well as the clavicle, first rib, and the upper end of the humerus of the right side, and some of the dorsal vertebræ; but much breakage had taken place, and parts of a fibula and tibia of the left side found in relation with these bones by us in 1874, were found to be parts of bones taken up by Mr. Royce in 1867, and given by him to me, showing that much disturbance had taken place then, and render it unsafe to suppose that any of the dislocations of the trunk bones, or, indeed, the separation of the head, may have dated from the time when the body was first put into the barrow. With what was actually seen by us in 1874 must be coupled what was reported to us from 1867, and this went to the effect that two headless bodies were found in this transverse strip of the barrow, west of the central walling, and that one of these lay about the centre of the barrow, and the other further to the south-west; whilst all the skulls, five in number, discovered in 1867 were in, or in the immediate neighbourhood of, the cist. The cist or chamber itself contained three bodies in 1867 undisturbed—at least to any recognisable extent. The fact that some of the entire number of eight bodies were found at a considerable distance from the skeleton-containing chamber, and that they were found without any of the upright flagging with which those of the other skeletons were placed; and the fact that two skulls, which may be supposed to have belonged to the two headless skeletons, were found placed close to the chamber, one on its north, the other on its south side, seem, when taken together, to indicate that the three skeletons in the chamber were interred at one time, but that time one subsequent to that at which the bodies found headless were interred, and that the skulls of these latter were removed at that time from their natural connections, and placed near the chamber. It is, however, plain that such an explanation as this combines the ossuary theory, which it would employ for the skeletons found undisturbed, with the view of holding that these interments are to be considered the successive interments of a family powerful enough to command the use of a barrow, which view it would employ for the skeletons found at a distance from the chamber. It is possible that it may be right so to combine these views.

Osteology and Craniography.—A few general remarks may be made as to the entire collection of human bones obtained from the long barrow, "Swell I," before we proceed to give in detail the craniography of the skulls which have admitted of recon-

* See Prof. Unger, "Götting. Anth. Verein," i., 1874, pp. 32—33.

struction. We have definite proof of the presence of eight skeletons in this barrow; of these eight skeletons, three belonged to children, and five to adults. Of the five adults, four had been aged; of the four, two had been men, two women. The fifth adult had been a man of from 24 to 30 years of age. Of the three children, one was about 2 years old; the other two were about 7 months at most. The four skulls which belonged to aged adults have been reconstructed. The skulls of the two adult females will be observed to differ greatly in size, the one being very large, the other very small; whilst the two adult female skeletons resemble each other in a point eminently characteristic of savage life—to wit, in showing that their owners were disproportionately short in stature, as compared with the male members of their tribe. The leg bones of the females give them a stature of 4 feet 10 inches and 4 feet 9 inches, against a stature of 5 feet 6 inches in the males; and a similar tale is told even more emphatically by a comparison of their respective collar-bones. The average difference between the male and female stature* of civilised races is about half this amount.

In two cases of the aged adults considerable loss of teeth had occurred before death; in the two others, precisely the reverse was the case. The young man, as might be expected, had retained his entire complement of teeth—in the upper jaw, at least, which alone we recovered in his case. The male lower jaws have the alveolar portion of the mentum relatively larger than in modern races of Europe; and in two lower jaws, one belonging to a male, the other to a female adult, the mental foramen is placed further back than is usual in European jaws. The tibia of four, if not of all the five adult skeletons procured from this barrow, are more or less what Professor Busk † has called “anteriorly platynemic.” Though the femora from this barrow were not markedly carinate—which, indeed, we should not have expected to find them to be, as correlated with this variety of platynemic tibiæ, all the bones had their muscular ridges well pronounced and defined, as though their owners, if not of very great stature,‡ nor, as is probable, of the very poorest grade amongst a savage tribe (all of whom, however, are always poor), were yet in the habit, whether from choice or necessity, of using considerable muscular force.

* See “*Archæologia*,” xlii. p. 447.

† See “*Journal Eth. Soc.*,” London, Jan. 1871, p. 459.

‡ For the large size of the chiefs in savage tribes, see Whitmore, “*Contemp. Rev.*,” 1873, p. 392; Brencley, “*Cruise of the Curagoa*,” p. 137; Erskine’s “*West Pacific*,” pp. 155 and 240; Forster’s “*Observations*,” p. 229; Ellis’s “*Polynesian Researches*,” ii. 26.

Several of the humeri, for example, had the deltoid ridge very strikingly developed, as though their owners had laboured at lifting the stones of the barrow which was one day to cover them. One of the humeri, it may here be noted, and that, as M. Broca has noted* to be usually the case, a female's, had an olecranic perforation. Two scapulae, with unanchylosed acromial processes, were observed here, a fact of small consequence by itself, but pointing, when taken in connection with others, to the probability of blood relationship having existed between the several occupants of the tumulus.

In their texture, colour, and manganese discoloration, all these bones resemble each other pretty closely, and convey to the mind a strong impression of their antiquity.

Craniography.—*Swell i. (a).*—Skull of woman, past middle period of life. To this skull probably belong an upper and a lower jaw, and a femur, labelled accordingly, and giving a stature of 4 feet 9 inches; as also a couple of very small clavicles, and a very slender radius.

| | | |
|------------------------|------|-------------------------------|
| Ext. length, in inches | 7.65 | Ceph.ind. (approx.), but the |
| Ext. breadth (approx.) | 6.0 | skull is broader as restored |
| Ext. height (approx.) | 6 | than it was in nature . 78 |
| Circumference . . . | 22 | Interangular lower jaw . 3.8 |
| Least frontal diameter | 3.9 | Ant. post. index† . . 90:195 |
| Greatest frontal . . | 5.1 | Basilar angle (approx.)‡ . 10 |

This, though a very large calvaria, must nevertheless be a woman's, not only for the intrinsic reasons of the verticality of its forehead, the comparative verticality of its parieto-occipital region, the general smoothness and roundness of all its outlines, and the small size of its supra-orbital and mastoid ridges, but also for the extrinsic reason that from the cist and its neighbourhood evidence of four other adult bodies is before us, one of these being a woman's skeleton nearly entire, the other three being undoubtedly male skulls, accompanied, however, by a second set of adult female bones, which can only be referred to this skull.

The first thing to be remarked, perhaps, is the enormous difference of size of the two female skulls, and the consequent unsafeness of saying that men and women are or are not of

* "Mémoires," ii. p. 366, 1874.

† By "antero-posterior index" is meant the relation held to the extreme length by that part of it which lies anteriorly to a line drawn as a tangent to the anterior border of the auditory foramen, and cutting the line of extreme length at right angles. It is easily taken by fitting an indicator to M. Broca's "cadre à maxima." It shows the degree of frontal development, and, *per contra*, of occipital dolichocephaly.

‡ Taken with M. Broca's Goniomètre occipital. See "Rev. d. Anthropologie," ii. 2, p. 202, 1873.

much the same size in savage races. There is some indication of a post-coronal furrow in this skull, to which some internal thickening corresponds, as is usual. This skull would be spoken of as belonging to the Sion types, just as skull (c) would be referred to the Hohberg type of His and Rüttimeyer.

The lower jaw, which with much probability can be referred to this skull, is feeble, riding up from the level of the mental foramen forwards, which foramen, however, is further forward, being in the plane of the first premolar, than in some other lower jaws of this series. The teeth are much and horizontally worn; the wisdom teeth were never evolved, in correspondence with which fact the smallness and absence of wear of the wisdom teeth, in an upper jaw probably belonging to this skull, are to be noted. The ramus forms an oblique angle with the body of the bone.

Sicelli. (b).—Skull of a man past the middle period of life. The cranial bones are thick, and the pits for the Pacchionian bodies well developed. To it probably belongs an old upper jaw. The lower jaw, probably belonging to it, indicates age by the wear of its teeth and the loss of all its molars, except one on each side. The jaw is somewhat atrophied in consequence of this, and the ramus lies obliquely to the body of the bone.

| | | | |
|-----------------------|-----|-----------------------|----------------|
| Ext. length in inches | 7.6 | Occipital arc | 5.0 |
| Ext. breadth . . . | 5.4 | Entire arc | 16.8 |
| Vert. height . . . | 5.8 | Ceph. index (approx.) | 70 |
| Absol. height . . . | 5.7 | Basilar angle | 30 |
| Frontal arc . . . | 5.2 | Ant. post. index . | 110:192 |
| Parietal arc . . . | 5.6 | Basi-cranial axis | 4 |

The high basilar angle of this skull shows that if it had retained its maxillary bones and teeth it would, in all probability, have rested upon its occipital condyles and teeth when placed on a flat surface. Having a high figure for its vertical arc, coupled with the ordinary length of basi-cranial axis, its cranial vault has been rotated forward so as to throw the bregma far (viz. $\frac{1}{10}$ ths of an inch) in front of a line drawn from the auditory foramen upwards at right angles to a horizontal line. The highest point in the vertical contour is 2.1 posterior to the coronal suture, and from this highest point the parietals slope over, so as to form an equable incline with the superior occipital squama. There is a very large occipital spine which hinders the exterior surface of the skull from showing any great difference between the glabello-postremal and the glabello-inial diameters. The conceptaculum cerebelli, though sloping upwards, is yet far from approaching the vertical line as nearly as in typical brachycephalic skulls. The forehead slopes gently from the line of

the largely-developed supraciliary ridges to that of the frontal eminences, after which it passes, with greater obliquity, into the upwardly-inclined plane of the anterior halves of the parietals. The frontal is markedly carinate, its mesial elevation passing continuously onwards into the still better marked parietal ridge, on either side of which a post-coronal depression is visible exteriorly, corresponding with an inwardly-looking convexity of the inner skull table. It presents a well-marked pentagonal outline when viewed in the occipital norma, the parietal tuberosity being nearly as well marked as the mesial vertical carina.

Swell i. (c).—Netherswell, Dec. 1867.—Strong man, past middle period of life. To this cranium may probably be assigned the femur, measuring 18·4 in., as also the bones found *in situ*, September 22nd, 1874, but without a head. The other two male skulls are either too old or too young to have these bones assigned to them; the stature of this man would, therefore, have been 5 feet 6 inches.

| | | | |
|---------------------------------|-----|----------------------------|---------|
| Glabello-inial length | 7·9 | Parietal | 5·1 |
| Ext. length | 8·2 | Occipital | 5·2 |
| Ext. breadth | 5·3 | Ceph. index | 64 |
| Vert. height | 5·7 | Ant. post. index | 115:210 |
| Least frontal | 4·1 | Circumference(approx.) | 22·3 |
| Frontal arc | 5·2 | Basilar angle (approx.) | 32 |

Typically dolichocephalic skull—Orthognathous.—Large supraciliary ridges, from which forehead slopes only slightly. The highest part of vertical contour is at coronal, when the head is held with the vertical line joining coronal suture and auditory meatus. The parietals slope very gradually to the occipital squama, which possesses a considerable length, looking vertically. In the norma lateralis nearly the whole of the parieto-occipital suture of that side comes into view. In the vertical view this skull is typically elongato-oval; there is some slight constriction immediately behind the region of the coronal suture; the broadest part of the skull is below and a little in front of the parietal tubera. The skull walls are compressed from side to side below the level of those eminences, and taper rapidly to the occipital squama. The sagittal suture is partially obliterated. Viewed from behind, the roof of the skull falls rapidly from the middle line to the region of the parietal tubera, and its walls converge again in the region of the squamosal. The orbital and supraciliary ridges occupy a plane anterior to that occupied by the commencement of the brain-case. The mastoids and temporal ridges are well developed.

The palate is narrow, deep, elliptical; the teeth much worn,

in a slanting, not a horizontal direction. To this skull may, with much probability, be assigned a lower jaw, with teeth similarly worn. Its angle is well defined and flanged outwards, and the body of the bone is emarginated anteriorly to it. The mental prominence is well marked, and, though narrow, is divided into two processes, one on either side. The alveolar part of the front of the jaw is deep. The mental foramen is further back than is usual in European skulls, being in the plane of the second premolar.

Swell i. (d).—Part of frontal, and right molar and maxillaries of a strong young man, æt. 20 to 24. The frontal appears to have been vertical up to the tubera, which are low down, and then to have sloped very gradually to the coronal suture. The temporal ridges are greatly developed.

| | |
|------------------------|------|
| Orbit width | 1.65 |
| Orbit height | 1.3 |

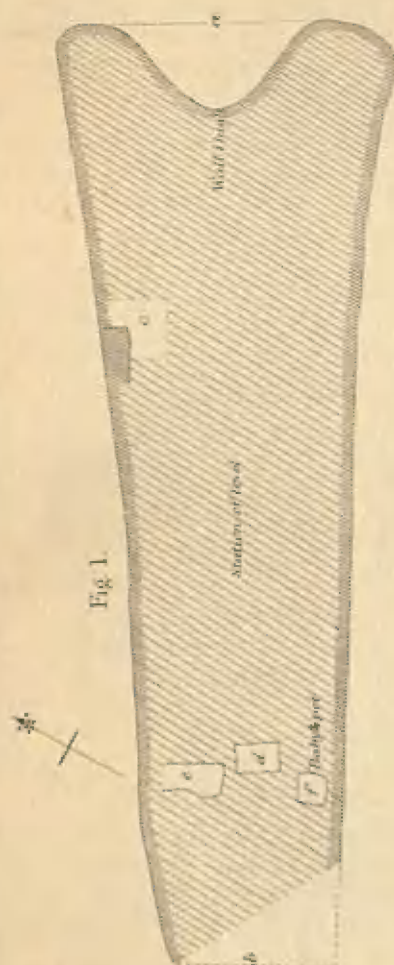
The wisdom teeth are in place, but have been very little used. The supraciliary ridges are large, but are not underlaid by sinuses.

Swell i., 22, 9, 1874.—Imperfect calvaria of old woman, 4 ft. 10 in. in stature, dolichocephalic both by contour and by measurement. It contrasts very markedly, as regards size, with the other female skull procured from this barrow, into the inside of which it could be put, though its owner was an inch taller (4 ft. 10 in. as against 4 ft. 9 in.) than the owner of skull in *Swell i.* (a). This skull might be taken as a fair specimen of the River Bed type of Professor Huxley, the larger as a fair specimen of the Sion type of His and Rüttimeyer.

| | | | |
|------------------------|-----|------------------------|--------------|
| Ext. length | 7.1 | Occipital | 4.2 |
| Ext. breadth (approx.) | 5.0 | Cephalic index | 70 |
| Vert. height | 5.3 | Femur | 16 |
| Frontal arc | 4.9 | Ulna | 9.2 |
| Parietal | 5.4 | Stature | 4 ft. 10 in. |

The forehead is vertical; the highest point in the vertical contour lies about an inch posteriorly to the coronal suture; the posterior half of the parietal curves evenly into the slopes of the superior occipital squama. The cerebellum was much overlapped by the posterior cerebral lobes. The lower jaw is feeble. The mental foramen corresponds to the interval between the second bicuspid and first molar. The teeth are very much worn down, and there are two or three alveolar abscess-cavities in the jaw. One very large one occupies a great part of the molar region of the left upper maxilla.

Many of the vertebrae, from the cervical downwards, are



FIGS. 1 & 2. GROUND PLAN AND LONGITUDINAL SECTION OF LONG BARROW, "SWELL VI."
FIG. 3. CHAMBER AND GALLERY FROM LONG BARROW, "SWELL VII."

beset with exostoses, but they are not anchylosed. The tibiæ were not sufficiently well preserved for me to decide whether they were platynemic, as were all the other four adult tibiæ. The femur is very much flattened in the region of the insertion of the glutæus maximus, but there is no flanging out beyond the plane of that insertion. This flattening is not rare in ancient skeletons with skulls of very various kinds. It has been noted by Holder* as existing in his "Ligurian" type. Only a few of the bones of this skeleton have become stained with manganese.

Sirell vi.—*Long Barrow in field known as "Long Ground," two miles west of Netherswell, Eyford, co. Gloucester* (Plate v. figs. 1 & 2.)—In the field next beyond the one lying on the left side of the road leading from Netherswell to Naunton, at the bottom of the first descent, and about two miles from the former place, we, that is to say, the Rev. David Royce, Canon Greenwell, and myself, examined, in September, 1874, a Long Barrow of very similar form to the horned tumuli described by the late Dr. Thurnam† and by Dr. Joseph Anderson, from parts of Great Britain as far apart from each other as Gloucestershire and Caithness respectively. A plan (Pl. v. fig. 1) taken by Sir H. Dryden, Bart., who visited the spot, and gave us the advantage of his experience, will enable anyone who wishes it to take the measurements of this barrow in detail. It is sufficient here to give the following particulars:—The broader end of the barrow was at E.N.E., and here the outlines of the two horns‡ were distinctly traceable; the westward end of the barrow had suffered more from agricultural operations than the eastward. The distance, however, from this end, as restored, to the centre point of the eastward end, was 108 feet. The distance between the tips of the two horns was 44 feet; the barrow tapered gradually from this, its extreme width, to a width of 24 feet at its westward end. The height of the tumulus was about 4 feet, on an average, but allowance must be made for possible diminution by farming processes. The two horns were not symmetrical, the north-eastern being the longer and slenderer. The limiting wall was made of the slate of the district, being Stonesfield oolite, arranged in about fourteen horizontal rows, and forming a boundary about 2 feet wide and 1 foot 9 inches high. The body of the barrow was formed of stones, with a general inclination inwards towards the middle line from either side; and in the middle line, here and there, a blackish seam was to be seen, due, I think, to accidental detritus of

* "Arch. f. Anthropologie," ii. p. 54.

† See above.

‡ The Gloucestershire tumuli appear to differ from the Scottish, in having only two horns, and those at the eastward end.

vegetable and other rubbish, during disturbances, in past time, of the barrow.

This barrow contained four more or less disturbed "chambers," or "cists," the position of which will be seen by reference to the ground plan. In the case of the first of these receptacles of the dead, which was the one which had suffered most in the way of disturbance, there can be no doubt that the term "chamber" is the right one to apply to it, as the liminary wall of the barrow formed a passage leading down to it; but in the case of the other three, this passage was not found to exist, and though the end stones, which give a "cist" its distinctive character—that, namely, of being closed on all sides—were not found *in situ*, it is easy to understand how they may have been the first to be moved, when the plough was first driven across the barrow, at right angles to the long axis of which they stood.

The "chamber" having been most completely ruined, we can with certainty depose to the presence of no more than two bodies as having been found, represented by fragments in its immediate neighbourhood, and as having, consequently, with some likelihood, been once contained in its interior when intact. One of these had been an adult, one a child, with the milk dentition only in place. The bones of the adult were discoloured with manganic oxide, as were those of an ox and horse found with them; those of the child were not.

Of the three other receptacles, "cists," or "chambers," for the dead, the first examined contained portions of the bodies of two adults and four children, together with the larger part of the skeleton of a young dog, and some other domestic animals' bones. The second contained portions of ten skeletons, all of which, with one exception—the skeleton of a boy or girl—had belonged to adults, whilst the fourth contained only one skeleton, that of a person between twelve and sixteen, with whom a fragment of coarse domestic pottery was found.

September 25, Friday.—The first operation in the way of examining this barrow took the shape of cutting a trench across its eastward end, at right angles to its long axis, at a level which subsequent examination showed to be about 8 feet to the westward of the central concavity of the horned eastward end.

At about 17 or 18 feet westwards from the centre point of the eastward end were found some bones of a child, with the milk dentition in place, about 2 feet or half-way down in the barrow. Parts, also, of an ulna, of a tibia, of the phalanges, and of both temporals of an adult, were found at about the same distance from the east end, and at a point a little south by west of the middle line. In the middle line of the barrow at this distance from the east end was a blackish seam of about 6 feet

6 inches in width, containing bones, but limited in the eastward direction by masses of stones, under which also were found a few fragments of human bones, adult and young. Amongst the bones from this part of the barrow was one fragment of burnt bone, possibly human, as well as some teeth of ox and horse. These teeth, as also the human temporals, were stained by the manganic oxide. These appearances were difficult of interpretation until we came upon the ruins of a "chamber," about 6 feet or so further to the north-west, the destruction of which, and the scattering the contents of which, may explain the blackening of the central strip of the barrow observed here, as also the presence of the human bones. The single burnt bone, whether human or not, may have been an accidental importation. Some adult teeth of *Bos*, from the south side the barrow, found together, are beautifully coloured by the manganic oxide.

September 26, Saturday.—A piece of the parietal of a human subject, beyond the period of childhood at least, a considerable development of diploë having taken place in it, was found at the bottom, to the south of the middle line, under the slaty, slantingly-arranged rubble, not under the central deposit, at a point about 27 feet from the centre point of the eastward end. On a level with it, as regards the long axis of the barrow, but close to its northern wall, we came upon a stone, 4 feet 9 inches long, 3 feet 2 inches high, placed on its edge, and sunk some way into the natural soil. It had its long axis at right angles to that of the barrow, the wall of which, as afterwards discovered, formed a passage, 4 feet 2 inches wide, leading down to it. Another large stone, 2 feet 10 inches long, 3 feet 3 inches high, also standing on its edge, abutted on the inner end of the first stone, and projected in a south-westerly direction into the barrow; and two other large stones were lying flat near the upright ones. There can be little or no doubt that these stones represent what was once a chamber, such as that found in the Long Barrow, Swell i.

On this day some few bones of mammals and birds were found in the barrow, west of the line of the cist, and some way above the level of the natural ground. The mammalian bones belonged to ox, sheep, pig, dog, vole, and rabbit: the larger bones amongst them appeared to be ancient; whilst the smaller, like the bird-bones, some of which belonged to a goose, and some to a fowl, and some to a bird smaller than a pigeon, may have been comparatively recently introduced into the barrow. None were stained with manganese.

September 28, Monday.—A fragment of a tobacco-pipe was found low down, in fact, on the natural soil. On this day the Rev. David Royce came upon the boundary-wall, which had

two prolongations inwards, to meet the chamber represented by the large stones mentioned above, and formed thus a passage 4 feet 2 inches wide. The remainder of the day was employed in tracing out the two horns of the east end of the barrow.

September 29, Tuesday.—At a distance of 46 feet from the apex of the re-entering angle, in the centre of the east end, we found the skeleton of a child of about 5 or 6 years of age lying just outside the boundary-wall, on the south side of the barrow. The child had been buried in the contracted position, and had been laid upon the right side, with one hand at its face and the other upon its hip. The teeth have the same purplish blackening, due to manganese, upon them, which has been so often observed in these long barrow bones from chambers.

On this day we came upon what I believe may have been the ruins of a "cist," i.e. of a closed grave, walled in with slabs, and without any passage leading to the exterior such as has been noted in the other barrows, and also in this, and as would have justified us in speaking of it as a "chamber." It was 80 feet from the re-entering angle at the eastward end, and being about 5 feet 6 inches by 4 feet, had its long axis at right angles to, and in the middle line of, the barrow. In this cist were found parts of two adult human skeletons, one belonging to a strong man, the other to a woman past the middle period of life; of the skeletons of three children of from 7 or 8 years of age; of one child, of about 2 years of age or less; of a dog's skeleton, lying *in situ*, and close to the bones of the old woman, as also scattered bones of ox and sheep. The bones themselves, closely packed at first, had been much disturbed subsequently, as had also the cist itself. An indication of this was furnished to us by the discovery of the fragments of a drinking-cup only a couple of inches from the surface of the soil over the barrow. This cup was of a not uncommon pattern, thong-made; and with its paste red outside and black inwards, but was somewhat thicker than "drinking-cups" are usually. It had probably been interred with a body of a later period than those buried in the cist, and had come into the position in which we found it in consequence of agricultural or other disturbance of the place. To such other disturbance the following appearances seemed to speak. The bones seemed in a few cases to have been left, partially, at least, *in situ*; but in many cases I found a few bones between a couple of slates, the lower of which, in its turn, overlaid a second set of bones. This would appear to be explicable by supposing that, the roof of the cist being removed, its contents were taken out partially, and then thrown in again, with any rubble which came to hand, so as to fill the cist up again.

It is not safe to say what the precise size of the cist had been originally, but it may have been somewhere about 5 feet by 4 feet. The bones contained in it, when examined by me, were disposed as follows:—The first bones come upon were bones of children, some of which had apparently been left *in situ*, and upon the left side, whilst others had as evidently been disturbed. As there were no less than three children with the first permanent molar in use, but with no more, or with only the first incisor of the second set in addition, and consequently all three between 7 and 8 years of age, in this cist, and the western half of it, and, besides them, a child of 2 years, or something less, it is a little difficult to be quite sure how many of so many similar bones had been placed *in situ*. None of all the bones lay upon the natural ground, but all had a flagstone interposed between them and it. On the south side, and, I think, at the south-west angle, part of the lower jaw of a strong adult and the atlas were found near each other. Further east, under one large flagstone, were lying the patella of a strong adult male and some bones of a skull of a child. Of course, these bones must have been disturbed to get thus into company with each other, and with no other bones between two flagstones. In the middle of the cist were found some of the bones of a youngish dog, and amongst them its lower jaw, which show it to have been about the size of an English mastiff; and in the same situation were bones of ox, of sheep, and of several human subjects, young and old. But the most striking “find” in the cist was in the north-east corner. There, between two large stones, were found, lying *in situ*, the femora, humeri, ulnæ, radii, clavicles, pelvis, ribs, and many vertebræ of a woman past the middle period of life. She had been laid on her left side; and between her chest and the north wall of the cist lay the pelvis and leg bones of a young dog, which we may, with some probability—bearing in our recollection the interesting account by an eye-witness, Ahmed Ibn-Fozlau, of the incremation of a Norse chief, translated for us by Holmboe and Anderson*—suppose to have been put into the grave to keep his aged mistress company, there and elsewhere. The woman had been laid so that her skull just projected beyond the slab upon which the upper trunk bones were laid; and the skull had just escaped from being smashed, when the top stone fell in, at the cost of being carried off, probably by some mediæval or later tomb-riflers, and so lost to us. Half the lower jaw was still *in situ*, and has been recovered.

Swell vi., Cist 1.—Under this slab, together with the dog and

* “Proc. Soc. Ant. Scot.,” May 13, 1872. Compare Nillson, “Primit. Scand.,” ed. Lubbock, pp. 140, 150; “Frilford Graves,” p. 9; “Archæologia,” xlii.

man, were the thigh bones of one of the children, and also femur of sheep. The lower jaw of the old woman was feebleish, as compared with some of the male jaws, but not with all, from these barrows. It had lost no teeth from the half we recovered, during life, though the teeth were very much worn down, and the first molar, notably, down to its fangs; in connection with both of which there were alveolar abscesses.

The femur, 16 inches long, of the woman, laid in company with the young dog, gives a stature of 4 feet 10 inches. It is considerably flattened from before backwards, in the region of the insertion of the glutæus maximus, but the insertion of this muscle is at the free edge of the bone. The whole bone, and others with it, under the label, "*Cist in situ*, Swell vi.," gives the idea of their owner having had hard work and poor food, being, as they are, slight, but with rough ridges. The other adult bones may have belonged, and probably did belong, to a man beyond the middle period of life, of moderate strength; many of the bones are exostotic, as would be expected in the bones of people of such early times, living in a bleak upland country, such as the neighbourhood of Swell.

From the contents of this cist a child's skull has been reconstructed by Mr. Wm. Hine. *Æt.* circa 7 or 8.

| | | | |
|--------------------|-----|----------------------|-----|
| Ext. length . . . | 6·5 | Least frontal . . . | 3·4 |
| Ext. breadth . . . | 5·1 | Lowest frontal . . . | 4·5 |
| Vert. height . . . | 5·3 | Ceph. ind. | 78 |

This is a high cephalic index, but its height is explained by the skulls having been reconstructed in the interests of brachycephalism, a direction the reverse of what is usual in reconstructed or shrunken skulls; and that this is so, is demonstrable from the fact, that one of the temporals will not fit in between the parietal and frontals.

The interior of the frontals in this skull are richly, and the interior of the parietals more sparingly, covered with vascular osseous upgrowths, just as (skull E, May, 1864, Long Wittenham, Univ. Museum) in many skulls in which the widening of the lower jaw, and with it the easing outwards of the lateral walls of the skull, begins to put an end to the constant pressure which the brain previously kept up upon the skull's interior surface.

Some of the bones from this cist are encrusted with stalagmite, notably those of the old woman, but none of them have any manganic discolouration. One of the humeri of the old woman, the right one, has an olecranic perforation, this peculiarity being in the bones from these barrows, as in some other cases*

* See Bruce, *Mém. ii.* p. 366.

observed in the female more frequently than in the male bones. Many of the bones are beset with exostoses, as in the bones from Swell i.

September 30, Wednesday.—On this day a third receptacle, "cist," or "chamber," was found to the north of the one just described; it was 4 feet 6 inches wide at its widest part, 3 feet at its narrower, which occupied three-eighths of its entire length of 8 feet, so that it had somewhat of the shape of a bottle. Its long axis, as was the case in both the other similar receptacles, ran at right angles to that of the barrow; its narrower end was within a couple of feet of the north wall of the barrow; its south-east angle was 82 feet from the re-entering angle of the east end. Within this "cist" or "chamber" were found parts of no less than ten skeletons, of which Canon Greenwell, who superintended the examination of it in my enforced absence, speaks as follows: "It was very difficult to say whether any body was entirely undisturbed, though some had some of the bones in their relative positions. The six bodies" (found on the first day) "were huddled into so small a space, and the bones were so much broken, that it was impossible to make out the relative position of the bones of the several bodies. I think, however, that some, if not all of the bodies had been placed in the cist in the flesh, or, at all events, when the ligaments were there. . . . All the skulls seem to be at the south side of the cist. . . . These cists are very puzzling. . . . I do not think they have been tampered with in late times, and the whole appearance suggests an ossuary."

On October 2 (Friday), Canon Greenwell wrote that the "cist" has had ten bodies in it, and some certainly in position, if all were not. I incline to the ossuary theory more and more." Details as to the osteology of this rich "find" will be found further on.

Another "cist" or "chamber" was discovered on the same day as this, making up the entire number of receptacles for skeletons, "chambers," or "cists," to four. In it were found the bones of but a single individual, a young person between the age of twelve and sixteen, the upper epiphysis of the ulna being unanchylosed, whilst all the permanent, except the wisdom teeth, were in use, and an urn of black, coarse ware of quite different character from the one already spoken of as found placed superficially to the second "cist." This cist was about 4 feet square; it was close upon the southern wall of the barrow, and about 85 feet from the re-entering angle of its eastern end. The fact of this cist having but a single occupant, and this occupant being a young person, and being accompanied, which was not the case with any other skeleton found in these long

barrows, by a food-vessel, are not unimportant. In this barrow, as in the two other long barrows examined by us in this locality, and also in the cases of certain other Gloucestershire long barrows, and in the case of the long Scottish cairn, Camster, in Caithness, no burial had taken place at the east end.

Osteology.—(*Sucell vi.*, C 2).—From the “chamber” or “cist” No. 2, examined by Canon Greenwell, and labelled *Sucell vi.* C 2, we have evidence, through the lower jaws recovered by him, of no less than ten bodies having been interred in it. Of these bodies only one had belonged to a person below the age of puberty, this one having belonged to a boy or girl of eleven to twelve years of age; six had belonged to persons past the middle period of life, one to a young man with the wisdom tooth just coming into use, a ninth to a man in whom that tooth had come into use, but had had only little wear, and a tenth to a woman in the same condition of dentition. Three of the ten appear to have been women, two of whom were aged, and one probably about thirty years of age; four appear to have been strong men, past middle life, but the sex in one case is doubtful; one of them had been a strong man of about thirty. The lower jaw of the sixth male subject, in which the wisdom teeth are just rising into use, does not enable one to predicate much as to his strength beyond what is implied in assigning it to the male sex. All the lower jaws except three lie evenly from angle to mentum, when laid on a horizontal surface; only one has the foramen mentale further back than it is found to be in modern European specimens. The alveolar portion of the mental region has not the same relative development as is observable in several of the lower jaws from the other long barrows of this district, and this and some other osteological considerations, approximating these skeletons to later, rather than earlier, Celtic types, when coupled with the fact that these bones are much less stained with manganese, and that the grave containing them was most probably not connected by a gallery or passage with the exterior, as is usual in long barrows, incline me to think that this collection of bones may be of less antiquity than the others. In none of these lower jaws had any teeth been lost before death; in only one is there any caries visible, and in one other there is a cavity formed by an alveolar abscess in connection with a lower front molar worn down to the fangs, and with its pulp-cavities almost entirely obliterated by osteo-dentine.

A considerable number of anteriorly platytenemic tibiae have been removed from this cist; one femur, length 18·2 inches, giving a stature of 5 feet 6 inches, came with such a tibia, length 13·3 inches. It is somewhat flattened superiorly, but is not

carinate, though in all probability it belonged to a male subject. One tibia, not platynecmic, has been recovered from this cist; its length is 13·1 inches, giving a stature of 4 feet 9 inches. Three humeri, probably of females, with olecranic perforations, have been recovered from this cist, two of which possibly, though not probably, belonged to the same female subject. Of three other adult female humeri from this cist, one shows the commencing of perforation; the other two have no indication of it. Some of the human bones and some of the brute bones found in this cist or chamber present the manganic discolouration. The male and female bones, when compared, show the female bones, especially the clavicles and humeri, to be disproportionately smaller than the male. Some of the bones are beset with exostoses. The instance of an ossified costal, and another of an ossified ensiform cartilage, belong to this series.

Swell vi. (2, 1).—Skull, with part of lower jaw of a strong man in middle period of life, corresponding with the Hohberg type of His and Rüttimeyer. 1 and 2 were close together at south-west corner of cist, with other bones, all disturbed, but still in some order. N.B.—Parts of two bodies, one a frontal of woman.

| | | | |
|----------------------------------|-----|-------------------------|-----|
| Ext. length . . . | 7·5 | Ceph. ind. | 72 |
| Ext. breadth . . . | 5·3 | Glabello-inial length . | 7·3 |
| Vert. height (approx.) | 5·9 | Circumference (approx.) | 21 |
| Ant. post. index, 97 out of 190. | | | |

There is considerable obliteration of sutures internally. The teeth are much and horizontally worn; some appear to have been lost during life, but no wisdom teeth were developed. The mastoids and supraciliary ridges are large, and the muscular lines for the temporal insertions pronounced. Frontal and parieto-occipital regions describe an even curve. The highest point in the vertical arc is a little posterior to the coronal suture. The sides of the occipital pentagon incline outwards a very little from the region of the parietal tubera, which in this skull are very faintly indicated, as in the Hohberg type of His and Rüttimeyer, which it resembles also in its well-marked vertical carination. The mental prominence is not very great, but is markedly triangular when viewed from in front.

Under this label came the frontal and other bones of a woman.

Swell vi. (2, 2).—Skull, with part of lower jaw of woman past middle period of life. This skull was in the south-west corner of the cist, close together with *Swell vi.*, 2, 1. Other bones were together with the skull; some finger-bones

were at the head of 2; and in front of neck a bead of Kimmeridge shale; but the bones were so much intermixed, it was difficult to say with which body it was associated.

| | | | |
|----------------------------------|------|-------------------------|-----|
| Circumference . . . | 20·3 | Vert. height . . . | 5·7 |
| Ext. length . . . | 7·2 | Ceph. ind. | 77 |
| Ext. breadth . . . | 5·6 | Glabello-inial length . | 6·8 |
| Ant. post. index, 98 out of 183. | | | |

This skull, though large, and notably possessed of large mastoids, is, nevertheless, all but unquestionably a female skull, as shown by the verticality of its forehead, the absence of large supraciliary ridges, the prominence of its parietal tubera, and the smallness of its teeth.

The highest point in the vertical antero-posterior arc lies a little behind the coronal suture. The parieto-occipital, like the frontal region, has the vertical dip characteristic of the female sex. The difference—four-tenths—between the glabello-post-remal and the glabello-inial diameters depends to a considerable extent upon the thickness of the superior occipital squama. Viewed in the vertical aspect, the skull presents a smoothly rounded-off outline, which has its point of maximum width in the meridian of the mastoids, and tapers somewhat rapidly forwards, and more gradually backwards, from that level, 123 parts out of 183 being anterior to it, as in *Swell vii.*, 1, 1. The tubera parietalia are prominent, and the lateral walls converge downwards from them, and, as in female skulls, there is no vertical carination.

This skull has many of the characteristics of the "*Sion typus*," in contradistinction to those of the *Hohberg*; but they are referrible, I think, to the difference of sex mostly, *e.g.* the forward position of the point of greatest width, the smoothly rounded outlines, and the absence of a vertical carina.

An upper incisor and a canine are the only teeth lost during life.

Swell vi. (2, 3).—"Just south of 1 and 2 came another body, 3, with fingers at head, but whether disturbed or not I cannot say" (note of Canon Greenwell). To this may, perhaps, be referred an occipital and part of a parietal, labelled *Swell vi.*, 2, 4. This occipital resembles the one just described, and also that belonging to *Swell vi.*, 2, 5, in its great thickness.

Swell vi. (2, 4).—Immediately east of 1 and 2, another body, 4, on right side, head to E.S.E. At knees of 4, another body, 5.

Portion of calvaria of, probably, woman in or past middle period of life, long, flat, and low, from, probably, very much such a skull as *Swell vi.*, 2, 5; so that it is possible enough

that these two skulls may have belonged to a mother and a daughter. The adult female humeri imperforated.

Under this label came also the bones of a strong male subject, many of which were exostotic.

Skell vi. (2, 5).—This calvaria probably belonged to a woman in the middle period of life. All the bones are of considerable thickness, but the skull does not bear the appearance of old age in other respects. Under it, however, are the bones of a much older and stronger subject (sex?). To it probably belongs an upper jaw which had lost no teeth during life, though some are much worn, and in which no wisdom teeth have been developed.

| | | | |
|----------------------|-----|------------------------|-----|
| Ext. length | 7.4 | Ceph. index | 7.2 |
| Ext. breadth | 5.3 | Glabello-inial | 6.8 |

There is a furrow developed along the posterior two-fifths of the sagittal suture; and in this respect, as in the more significant one of its elongato-oval vertical contour, and its fairly rounded-out outlines, as also in its relative lowness, so far as can be approximatively made out, this skull resembles the dolichocephalic form so common at Frilford, and in other Romano-British cemeteries. I have seen similar skulls in Dr. Thurnam's collection from Tilshead, West Kennet, and Nympsfield, but they are not common in early British cemeteries.

A bone of a pig came with these bones, as also parts of another and older human subject, distinct from either, under label vi. 2, 4.

At knees of 4, another body, 5, apparently on right side, head to E.S.E., hands to face, only one piece of lower jaw.

Skell vi. (2, 6).—

| | | | |
|------------------------|-----|-----------------------|-----|
| Ext. length | 7.7 | Glabello-inial length | 7 |
| Ext. breadth (approx.) | 5.6 | Frontal arc | 5.7 |
| Vert. height | 6.1 | Parietal arc | 6.1 |
| Ceph. index (approx.) | 74 | Occipital arc | 4.9 |

Calvaria with upper and lower jaws of man in middle period of life. The sagittal suture is entirely obliterated internally. The teeth, some of which had been lost during life, though none are carious, are a good deal worn. The mentum is characteristically triangular, but not prominent. The foramen mentale is in the line of interval between præmolar 2 and molar 1. The forehead is vertical up to the level of the frontal eminences; it then passes with an even curve backwards. The highest point of the vertical arc is an inch behind the coronal suture, the posterior halves of the parietals form an equable slope with superior occipital squama. The frontal sinuses are large.

It is a good representative of the Hohberg or Cumbecephalic type of skull.

With this skeleton were the humerus of a mole and a tooth of a fox.

Note by Canon Greenwell.—“Just south of 5, another head, 6, whether disturbed or not cannot say. The whole looks as if bodies had been partly divested of flesh.”

Swell vi. (2, 7).—Under this label came two lower jaws, one certainly of a man of some considerable strength, and about 30 years of age; the other may have belonged to either a man or a woman, but in either case to an aged individual. Neither jaw had lost any teeth before death, though there is much horizontal wear of them in the older jaw.

Note by Canon Greenwell.—“Close to the west end of cist, at north side, a skull, 7, on the right side, laid on hip bones and sacrum of another body. There is connection with one femur at least. . . . The body, 7, must have been on right side. Under 7, and pelvic bones, a very rotten skull, 8.”

Swell vi. (2, 8).—Boy or girl of about 11 or 12 years of age.

Swell vi. (2, 9).—Skull of an aged person, probably a female; but under this label there are certainly parts of two bodies—one a strong man's, the other a woman's. The skull and the lower jaw I incline to think a woman's. With the skull came, in one paper, two vertebræ, two of the upper dorsal, with the following note: “These belong to 9, and were placed 1, 2, across the line of the others.”

In another, seven of the lower dorsal came also in a paper by themselves. On the paper a note was written to the effect that they had all been found in connection.

The dislocation of backbone of 9 was probably caused by the lower part, which was on a large stone, not having gone down while the upper part settled.

The femur is flattened in region of glut. max., and gives a stature of 5 ft. 6 in. The tibia is flattened; but did these bones belong to the skull?

| | | | |
|----------------------|-----|-----------------------|------|
| Ext. length | 7·1 | Ceph. index (approx.) | 75 |
| Extreme breadth . . | 5·3 | Femur | 18·2 |
| Vert. height | 5·5 | Tibia | 13·3 |

Viewed from above, this skull has an evenly ovate contour, tapering only very gradually either backwards or forwards. The point of maximum width is in the meridian of the mastoids, which are large for a female skull. The forehead is vertical up to the level of the tubera, and the parieto-occipital region is also a little more vertical than is usual in skulls of this elongated type. The parietal tubera are less well marked than is usual in female skulls. The supraciliary ridges, however, are characteristically female, as are also the low height index and





Fig. 3.



Fig. 2.

LONG BARROW. "SWELL VII."

the lower jaw, the teeth in which are very much worn, and, though an alveolar abscess was developed under the anterior molar, had not been diminished in number by more than one or two during a very long life.

Note by Canon Greenwell.—“Just north of 7 and 8, a body, 9, on left side, head to south, apparently in position; hips are 7 inches higher than the head. Just north of hips of 9, a skull, 10, close to surface and much disturbed, No. 9 being the highest body, as regards the hips. The fact of its being undisturbed shows that any dislocation or breakage is not due to modern agencies.”

Swell vii. (Pl. vi.)—The third long barrow examined at Netherswell in Sept., 1874, is situated on a hill to the N.W. of Netherswell Church, in the district known as Upper Swell, upon the estate of Alfred Sartoris, Esq., by whose kindness Canon Greenwell was allowed to explore it. It is the largest of the three barrows examined here, and resembles the second very closely in its contour, and both that and the first in the materials—oolitic flags and rubble—of which it is made up. Its extreme length is 173 feet. Its length from its westward end to the central concavity of its horns 156 feet; its extreme width, which lay about 20 feet west of the apices of the horns, is 57 feet; its least width, which is, as usual, at the west end, is 32 feet. The height of the mound is from 6 to 8½ feet above the natural surface; it is surrounded by a wall, which was 5 feet high at the east end, where it defined the outlines of the horns, and about 4 feet high round the sides and west end, being in thickness about 1 foot 6 inches. Its west end was quadrangular. Its long axis ran very nearly due east and west, as shown by the ground plan and sections (Pl. vi. figs. 1, 2, & 3), which, like the plan and section of “*Swell vi.*,” we owe to Sir H. Dryden, Bart.

The point of special interest in this barrow was the presence in it, at 24 feet from its west end, of a chamber (Pl. v. fig. 3) 7 ft. by 4 in size, which had long ago, though within the memory of man, been rifled, but which still contained, in September, 1874, evidence of having furnished lodgment to no less than nine human bodies. To this chamber a passage led, the limit between chamber and passage being marked by the presence of a sort of doorway, across which a large flagstone crossed, at a distance of 1 foot 3 inches from the ground, and helped to support the roof. The floor of the passage was flagged, whilst that of the chamber was not, and just outside the doorway opening into the “chamber” lay parts of two more or less disturbed skeletons, one of a woman, one of a child, overlaid by an almost or entirely undisturbed male skeleton.

As regards this arrangement of the stones of which the barrow was made up, it is well to state that between the north and south walls the largest stones were found in the middle line, and were thus often placed upright with the more outwardly placed stones sloping towards them, and resting upon them for some distance, and then assuming a more horizontal arrangement. The first three feet from the ground were occupied by larger stones; the upper three of the entire number of six, the average height of the barrow, were occupied by smaller and less regularly placed stones (fig. 3, Pl. vi.). It was here, owing to the size of the barrow, and notably its height, that we observed that the workmen, in removing the stones in the various exploratory incisions, came constantly to arrange the stones which they displaced, in horizontal layers, for the sake of security from downfalls. Thus an appearance just like that of the transverse "walling," often observed in the undisturbed parts of the barrow, was frequently produced, and it is obvious that the two similar arrangements, however different in date, must, in all likelihood, have been due to the same cause, viz. the consideration by the labourers concerned of their own convenience.

The concavity of the horns at the east end was filled up for a space of 2 feet in depth with fine, small stones, outside of which again came larger stones, all evidently arranged intentionally, and in no way owing their disposition to the disintegration of the tumulus into talus. The horned east end, therefore, which, to us, when we had removed these masses of stones, presented a magnificent and striking appearance, was not preserved to the eyes of the early Britons, who erected it, nor, till 1874, had it been presented to those of anyone else.

The almost perfect state in which one skeleton found in the passage was recovered enhances the regret with which we have to think of the rifling of the "chamber," and the destruction, for craniological purposes, of the nine, or possibly more, bodies it contained. This skeleton was much contracted, lying on its left side, with the head at south-west by south, with the right hand up to the face, and the left at the elbow of the right arm. The two skeletons which lay beneath this one had been disturbed, probably, when its owner came to be buried. One of the two disturbed skeletons had belonged to a child about two or three years of age, and it lay under the lower part of the man's skeleton, having all its upper part in position, with its head to the north. Close to the child's head was the arm-bone of a woman from 18 to 20 years of age, of whose skeleton the lower vertebræ and pelvic bones were *in situ*, whilst the rest had been disturbed, and the skull was missing. The femur was recovered, however, and being 15.9 inches in length,

gives a stature of 4 feet 10 inches; one disproportionately small, as compared with that of the male, which was 5 feet 5 inches.

No record has been preserved, or, at least, has been recovered by us, as to how the nine bodies, or more, which the chamber contained had been packed away in its area of 7 feet by 4. Some further interest is given to this barrow by the fact that some secondary Saxon burials were discovered in it in the November of 1874. Two of the three bodies discovered upon this occasion had been disturbed; one was in the extended position, and still *in situ* from patellæ to lower jaw, inclusive, but had suffered some displacement, owing, probably, to the exceeding shallowness (9 inches) of the grave in which it laid. With this skeleton were two buckles, one on each shoulder, a knife on the pelvis, an amber bead near the sternum, and a piece of red pottery (pseudo-Samian) at the feet. The bones show the skeleton to have been a woman's, of about 30 years of age, and the mode of burial shows the sex and nationality to be as above stated. The head was at the south, the hands upon the pelvis. Lying upon the chest of this skeleton were a number of fragments of another adult skull, and to the right of its knees were the femur, tibia, and humerus of a strong old man; and about 6 inches from the right humerus of the female skeleton were parts of the skull of a baby, some fragments of which were also found over the female skeleton, and between its legs. Probably, or all but certainly, the two skeletons of the baby and of the old man had been disturbed and replaced when the woman was buried. Some bones of ox and of sheep, the latter differing much in size, were found in this grave. The grave was about 18 feet from the re-entering angle of the horned east end, and probably to it may belong a "spindle whorl" of stone, found October 5th, by Canon Greenwell, 3 feet 9 inches from surface, when making a large excavation close to the spot where, a little more than a month later, viz. November 7th, the female Anglo-Saxon belonging, as she and her tribe might have phrased it, to "the spindle side," was exhumed.

Traces of another secondary burial, which, though earlier than that of these Saxons, was later than the burials of the occupiers of the chambers, and the passage leading to it, may be supposed to be furnished to us by the discovery of some fragments of a very beautifully ornamented drinking-cup on the top of the barrow, very near the apex of the south horn at the east end.

At the opposite end of the barrow, on its south side, and about 6 feet from the south end of the chamber containing the fragments of nine bodies, a piece of a red deer's antler, partly cut, was found among the small stones and clay, which at that

point formed the lower part of the mound. Bones and teeth of sheep, ox, and calf, as also a piece of burnt bone, probably human, were found elsewhere, some 3 ft. deep, some at the very bottom, in the barrow; and bones of sheep, ox, and pig were found in the chamber, together with the human bones.

Osteology and Craniography of human remains from Sucevii.—Under the label, "*Sucevii* gen.," signifying bones from the interior of the chamber generally, and under the label, "*Sucevii* 1," we have bones proving the presence in the chamber, and in the passage leading down to it, of no less than twelve bodies, eleven being bodies of adults, and one the body of a child. Two of the adults from this barrow appear to have been about 20 years of age, one about 30, and the rest to have been in middle life or beyond it. The long exposure to indiscriminate plundering which this chamber had undergone, accounts for the fragmentary condition to which most of the bones still left in it had been reduced; had a freer entrance been made into it, however, even what has been saved to us would long ago have been irrevocably scattered. Some of the long bones, however, have escaped, so as to allow us to measure them, and draw from these measurements conclusions very similar to those which the remains found in the two other long barrows here described have enabled us to draw. Some of the femora and some of the humeri, for example, must have belonged to men of very great muscular power, whilst some of the other long bones must have belonged to females of eminently small size and strength. Two radii, for example, measuring, one of them, $8\frac{2}{3}$ in., and the other, $7\frac{1}{10}$ in., and being exceedingly slender, though obviously adult, enable us to say that their owners must have been ill-nourished women, such as are the wives of savages, of a stature, in the one case, of 4 ft. 9 in., and in the other, of 4 ft. 7 in. The femora of the male and female skeletons found lying at the entrance to the chamber being 18.1 in. and 15.9 in. in length, respectively, gives us for their owners the disproportionate statures of 5 ft. 6 in. and 4 ft. 9 in., respectively. A similar disparity exists between the clavicles; an observation made, like several others relating to this barrow, also in the cases of the other barrows examined here, and in the case of the human remains from the caves* of Gibraltar, examined by Professor Busk. Six lower jaws were recovered from this chamber, all but one of which must have belonged to strong adult men. The body of the bone lies, in nearly every case, evenly, on a horizontal surface, and forms a right angle, or something nearly approaching a right angle, with its ramus. The mental foramen lies far back in several instances, and the alveolar portion of the mental

* See "Transactions Prehistoric Congress," Third Session, p. 54.

region is largely developed. In every case but one the full number of teeth was retained up to the time of death, even though the teeth are very much worn in most cases, and in some even down to close upon the fangs. There was only one case of caries. Mr. Mummery* has made similar observations to these in relation to Dr. Thurnam's Wiltshire skulls, remarking, in addition†, that a much less favourable state of things prevailed as to the dentition of the dolichocephali from the Yorkshire Wolds.

There were two humeri from this barrow, both evidently female, and possibly from the same individual, with olecranic perforations. Of the opposite condition of hyperostosis we have an example in the supraciliary ridges of one fragmentary and one nearly perfect frontal bone, the ridges not being underlaid by sinuses, but made up of cancellous bone. There were found here also one specimen of an ossified thyroid, and one of ankylosis of the dorsal vertebræ.

Many of the bones are encrusted with stalagmite; and a considerable number, both of the human bones and of the bones of sheep, ox, and pig which were found in the chamber, were discoloured by the manganic oxide, a circumstance which renders probable at once the contemporaneity and the antiquity of both.

Description of skull belonging to male skeleton found in passage leading into chamber.—*Swell vii.* (1, 1).—The bones of this skeleton show their owner to have been a man of about 30 years of age, traces of the suture between the first and second sacral vertebræ being still to be recognised in the middle line; to have been of average muscular strength, and of a stature of about 5 feet 5 inches. With his bones came also the jaw of a young pig, just as was the case with the bones from the chamber in *Swell i.*; as also some bones of a sheep or goat.

Cranial Measurements.

| | | | |
|-------------------------|------|----------------------------|--------|
| Ext. length . . . | 7·4 | Cephalic index . . . | 76 |
| Ext. breadth . . . | 5·6 | Antero-posterior ind. | 94:189 |
| Vert. height . . . | 5·65 | Distance from auditory | |
| Least frontal width . | 3·8 | foramen to fronto-nasal | |
| Frontal arc . . . | 5·2 | suture | 4·3 |
| Parietal arc . . . | 4·8 | Distance from auditory fo- | |
| Occipital arc . . . | 4·7 | ramen to nasal spine | 4·2 |
| Circumference (approx.) | 21 | Distance from auditory fo- | |
| Glabello-inial length | 7·3 | ramen to alveolar edge | 4·4 |
| Height of orbit . . . | 1·35 | Width | 1·6 |

* "Transact. Odont. Society," Nov. 1869, p. 13.

† P. 15, *loc.*

| | |
|--|-----|
| Interangular diameter of lower jaw | 4.1 |
| Depth of symphysis | 1.4 |
| Width of ramus | 1.4 |

This skull has the typical dolichocephalic contour when viewed in the *norma lateralis*, though by mere measurement it is less dolichocephalic than skulls from similar barrows usually are. The highest point in its evenly curving antero-posterior arc is at the coronal suture. Its most striking characteristic is the prominence of its parietal tubera, which mark the point of its maximum breadth. From this level the skull is wall-sided downwards, and to complete the character of an "ill-filled"* skull, it slopes upwards from the same level to the sagittal line. It further shows a flattening externally and a convexity internally over the posterior inferior angles of both parietals, an appearance corresponding to the presence of certain irregular fissures in the brain, immediately posterior to the middle temporo-sphenoidal convolutions, and indicative of a lowly developed brain. The mastoid, the glabellar, and the supraciliary ridges are largely developed, and the latter are not underlaid by any frontal sinuses.

Viewed in the *norma verticalis*, the skull is pear-shaped, tapering rapidly from the level of the parietal tubera, both forwards and backwards. The parietal tubera are situated well forward, occupying a point which is at the 105th division out of 189 of the line of the whole length of the skull from the forehead backwards. The occiput is blunted posteriorly; and in these two latter particulars the skull resembles the "Sion types" of His and Rüttimeyer. It is phœnozygous, as the "Sion types" are sometimes, though not always. The three principal sutures are complexly denticulated; the sagittal is nearly obliterated in the fifth of its length, corresponding to the entirely obliterated foramina emissaria. Internally the obliteration of the sutures has progressed much further than it has externally, and the walls of the skull are thick. In the *norma occipitalis* the pentagonal outline is very well marked, the lateral walls inclining inwards from the level of the tubera, and the roof falling away from a well marked sagittal elevation. The conceptacula cerebelli have the horizontal position so characteristic of dolichocephalic skulls. The palate is deep and elliptical. The wisdom teeth are little worn; the teeth anterior to them, on the contrary, very much. The lower jaw lies evenly on a horizontal surface; the alveolar portion of the mentum is largely developed; the inferiorly placed, triangularly

* For use and application of this epithet, see Cleland, "Phil. Trans.," 1869.

contoured portion of the chin is less in proportion than is usual in European skulls.

EXPLANATION OF PLATES IV. TO VI.

Plate IV.

Fig. 1.—Ground plan of Long Barrow, *Sicell i.* The actual outlines as observable in 1867, 1868, and 1874 are given in continuous lines; the dotted lines represent a conjectural restoration of the original outlines. *a.* Eastwardly-lying "horns," conjecturally restored after analogies furnished by Long Barrows at Uley, figured in "*Crania Britannica*," Pl. v., and "*Archæologia*," xliii. p. 49; by barrows in neighbourhood of Swell figured below (Pl. v. and Pl. vi); and by Caithness cairns, figured by Dr. Anderson, "*Proc. Soc. Ant. Scot.*," 1866-1868, Plan vii. Compare p. 141 *supra*. *b.* Chamber discovered in 1867, and containing then three skeletons, as described above at p. 144. *c.* Line limiting to the eastward a zone of from 2 feet 8 inches to 3 feet 6 inches in width, containing in various parts of its length eight human skeletons. See above, p. 142. *d.* Penannular structure, figured on larger scale in next figure, and described at p. 142.

Fig. 2.—Penannular structure, meaning doubtful, discussed at p. 142. From an anastatic drawing by the Rev. David Royce.

Plate V.

Fig. 1.—Ground plan of Long Barrow, *Swell vi.*, reduced from plan taken by Sir Henry Dryden, Bart. The actual outlines, as observed in 1874, are given in continuous lines; the westward end is given in dotted lines, as conjecturally restored after analogy of Long Barrow, *Sicell vii.*, Pl. vi. fig 1. See note, p. 153. *a.* Eastwardly-lying horns as actually seen in 1874. *b.* Westward end as conjecturally restored. *c.* Ruins of chamber described at p. 155. *d.* Ruins of cist described at p. 156, and named *Swell vi.*, *Cist 1.* It contained parts of two adult human skeletons, of four skeletons of children, and of a dog's skeleton, as well as bones of ox and sheep, or goat, within a space of 5 feet 6 inches by 4 feet. *e.* Ruins of cist described at p. 159, and named *Swell vi.*, *Cist 2.* It contained parts of no less than ten human skeletons. *f.* Cist described at p. 159, and containing bones of a single individual, between the ages of 12 and 16, together with an urn of coarse black ware.

Fig. 2.—Longitudinal section of Long Barrow, *Sicell vi.*, reduced from section taken by Sir Henry Dryden, Bart. The more closely-placed slanting lines represent the natural ground.

Fig. 3.—Chamber, with passage or gallery leading to it from Long Barrow, *Swell vii.*, shown, in ground plan, at fig. 1, Pl. vi. *a.* Chamber containing, when examined in 1874, parts of nine or more human skeletons, together with a few bones of sheep or goat, ox, and pig—all domestic. Its walls are seen to consist of vertically-set flags and horizontally-arranged layers of smaller oolitic stone. *b.* Doorway marking limit between the chamber and the gallery leading to it. *c.* Position of the three skeletons found externally to the chamber (see p. 166).

Plate VI.

Fig. 1.—Ground plan of Long Barrow, *Swell vii.*, reduced, as are also the two following figures, from a plan taken by Sir Henry Dryden, Bart. *A.* Westward quadrangular end of barrow. *B.* Eastward horned end. *C.* South wall of barrow. *D.* North wall. These letters correspond with those used in the two sections subjoined. *a.* Chamber containing parts of nine or more skeletons. *b.* Gallery leading to the chamber, and containing parts of two skeletons, and one entire skeleton (see p. 165, and fig. 3, Pl. v.). *c.* Site of Saxon graves a little less than a foot deep (see p. 167). *d.* Excavations made by Canon Greenwell.

Fig. 2.—Longitudinal section of barrow from point marked *A* to point marked *B* in fig. 1. The more closely-placed slanting lines represent the natural ground. Reduced from section by Sir H. Dryden, Bart.

Fig. 3.—Transverse section of barrow at points marked *C* and *D* in fig. 1 (see p. 166). Reduced from section by Sir Henry Dryden, Bart.

DISCUSSION.

MR. HYDE CLARKE observed, that in the Rocky Mountains there were tall savages, with the usual proportion between the sexes, but that in the case of one tribe the men were tall, like those of the neighbouring tall tribes, and the women were short, like those of the Utahs, Shoshones, and other short tribes. The difference was supposed to be due to a mixture of race. It was to be remarked that the language is that of the short tribes.

Professor HUGHES inquired whether it was clear that the bones, &c., had been burnt where now found; for if they had been burnt elsewhere, probably some chalk thrown in with them would be found unburnt, whereas all the chalk subjected to such a fire as that described would probably be converted into caustic lime, and if water percolated, would set in a form which could not be mistaken for chalk. He suggested that the irregular manner of occurrence of the parts of the same skeleton might, in some cases,

be explained by the falling-in of masses of mixed chalk and bodies, as the fuel which supported the mass, on being burnt, gave way.

Mr. PRIDEAUX observed, that he did not believe there was any evidence which authorised the conclusion that the difference in size between the male and female in man was dependent upon the stage of civilisation attained. He regarded it as a race characteristic, and one that varied greatly amongst the civilised inhabitants of Europe. On the whole, there was a greater difference in size between the male and female in England than in France. Nowhere had he noticed the difference so slight as amongst the dark-eyed race inhabiting Glamorganshire, supposed to be descended from the Silures mentioned by Cæsar, quite a large proportion of the women being fully equal in stature to their husbands.

The PRESIDENT and Mr. MUMMERY also joined in the discussion, to which the author replied, and the meeting separated.

APRIL 27TH, 1875.

Colonel A. LANE FOX, *President, in the Chair.*

The minutes of the last meeting were read and confirmed.

The following new members were announced: Mrs. ALFRED MORRISON, 16, Carlton House Terrace; Miss A. W. BUCKLAND, 6, Beaufort Buildings, Bath; Miss BARBARA MURRAY, 4, Westbourne Crescent, Sussex Gardens; LOUIS A. LUCAS, Esq., 2, Puttshill Place, Kentish Town.

The following list of presents was read, and thanks were voted to the donors:—

FOR THE LIBRARY.

From the INSTITUTION.—Journal of the Royal United Service Institution. Vol. XVIII. No. 79.

From the INDIA OFFICE.—The Primitive Tribes and Monuments of the Nilagiris. By J. W. Brecks.

From the IMPERIAL ACADEMY OF SCIENCES OF VIENNA.—Sitzungsberichte (philos.-histor. Classe) Band 77, Hefte 1, 2, 3, and 4, Band 78, Heft 1, Register; do. (Math.-Naturw.), 1874, I Abtheil, Nos. 4, 5, 6, and 7; II Abtheil, Nos. 4, 5, 6, and 7; III Abtheil, Nos. 1—5, 6, and 7.

From the ACADEMY OF SCIENCES OF CRACOW.—Memoirs of the Math. and Naturalhist. classes; Dissertation of the do. do.; The People of Cracow and the Environs. 4 Vols. By Oscar Colberg.

From the SOCIETY.—Bulletin de la Société d'Anthropologie de Paris. Vol. IX. No. 4. Vol. X. No. 1.

From the EDITOR.—Revue Scientifique, Nos. 42 and 43, 1875.

From the EDITOR.—Nature (to date).

The following paper was read by the author :

On the HEIGHT and WEIGHT of BOYS aged 14, in TOWN and COUNTRY PUBLIC SCHOOLS. By FRANCIS GALTON, F.R.S.

My principal results may be briefly stated. They show the comparative heights and weights of those boys who were 14 on their last birthday, in two groups of public schools. The one group is composed of schools situated in the country, and comprises Marlborough, Clifton, and Haileybury, together with the boys of the ages of 13 and 14 at Wellington, and those of the fourth form at Eton. The other group consists of schools situated in large towns, and comprises the City of London School, Christ's Hospital, King Edward's School at Birmingham, and Liverpool College. It appears that the boys of the above-mentioned ages in the country group are about $1\frac{1}{4}$ inch taller than those in the town group, and 7 lbs. heavier; also that this difference of height is due, in about equal degrees, to retardation and to total suppression of growth; and, lastly, that the distribution of heights in both cases conforms well to the results of the "Law of Error."

There remains, however, more to say which cannot be dealt with so concisely. I have to show that these results, scanty as they are, may be depended on, and to point out the reason which compelled me, and will, I fear, compel others who may work on these school statistics, to limit their inquiry to the age of 14. I also desire to illustrate by this memoir a method I have lately proposed ("Philosoph. Magazine," Jan. 1875) for dealing with statistics of the present kind, and which appears to me far more satisfactory, and which is much more natural, so to speak, than those hitherto in use.

My data are given in Table I., and are of the form: so many boys between 51 and 52 inches, so many between 52 and 53, so many between 53 and 54, and so on, giving a total of so many. I reduce all these figures to per centages, to the nearest integer, in order that we may in each case be supposed to be dealing with exactly 100 boys. For further explanation, let us refer to the line B in the data of heights of town public school boys, where we shall see what would take place supposing we had arranged 100 of them, in the strict order of their heights, at equal distances apart, along the side of a wall 100

TABLE I.—NUMBER OF BOYS AGED FOURTEEN ON THEIR LAST BIRTHDAY, IN THE COUNTRY AND TOWN PUBLIC SCHOOLS, WHOSE HEIGHTS AND WEIGHTS LIE BETWEEN THE LIMITS MENTIONED BELOW.

[illegible]

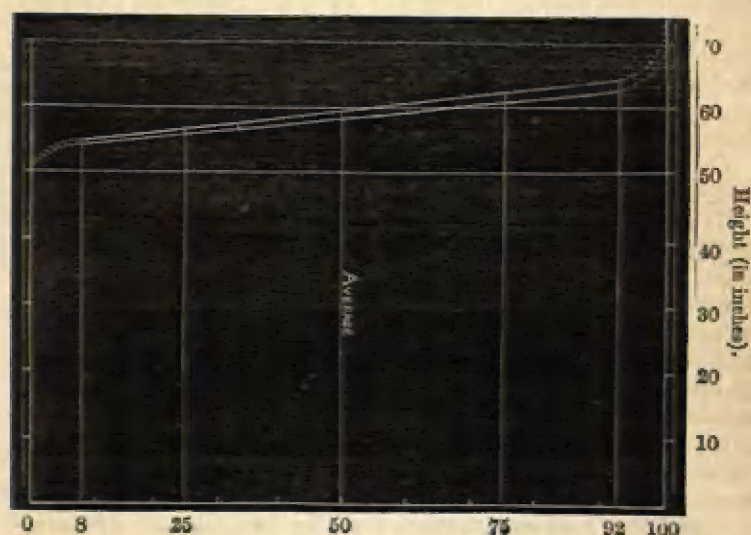
yards, or other divisions, long. A rod at the end of the first division would divide the boy under 53 inches from the 99 boys who were above 53 inches; another rod placed two divisions further (or three divisions in all from the beginning, as is shown compendiously in line C), would divide the 3 boys under 54 inches from the 97 above 54; another at the 6th division from the beginning would divide those under 55 from those above 55, and so on. Let, then, marks be put on the successive rods, at the several heights of 53, 54, 55, &c., inches, and draw upon the wall with a piece of chalk a flowing line joining those marks. This line or curve would just touch the heads of all the 100 boys, and would give an exact, *natural*,* and permanent record of the distribution of heights throughout the school. I draw such a line, not on the face of a wall 100 yards long, but within the compressed limits of a piece of ruled paper, in which each boy is represented by the narrow interspace between two lines. "Sectional" paper, divided into inches and tenths, is more than sufficient for the purpose, and, by its use, the curve which we had supposed to extend over 100 yards, is most easily compressed into 10 inches, as in the diagrams I submit for inspection. (*See fig. page 177.*)

On precisely the same principle can the distribution of weights or any other quality be protracted.

It remains to record these curves in a way that shall admit of their being compared arithmetically, and shall at the same time give us the usual objects of statistical inquiry, such as the "Average," and the "Probable Error." This is done by measuring a few appropriate ordinates, the same in every case, as I proceed to show. First, let us consider the peculiar shape of all such curves. There must of necessity be a remarkable similarity between them, due to the general fact, that in every group of objects that statisticians deal with, those of medium value are more numerous than those which are either large or small, and that, as the deviation from the mean value increases, the rarity of objects characterised by that degree of deviation increases with still greater rapidity, consequently the curves of which I speak must always have a long, steady slope about their middle; they must bend downwards with increasing curvature at one end and upwards at the other. They are therefore, of a necessity, curves of contrary flexure, such as are known in the idiom of architects as "ogives." Owing to their general shape as thus described, it would be a misdirection of labour to measure many ordinates about their middle. All that is really necessary, in such an instance as we are considering,

* Compare with Quetelet's method, as described and figured in his "*Anthropometrie*," p. 266.

is (1) the middle ordinate, which gives directly the *average* value, in the sense that as many cases fall short of it as exceed it; (2) and (3), ordinates at the 25th and 75th divisions. The latter divide the group into three parts, small, medium, and large, the medium being as numerous as the other two put together. Also, wherever the Law of Error applies, the difference between either of these ordinates and that at the 50th division, is identical with the well known quantity called the "Probable Error." I take the 4th and 92nd divisions: they are those which, when the Law of Error applies, differ from the 25th and the 75th, by exactly the same amount as either of these differs from the 50th. Such is approximately the case in the instances of height before us, when the common difference, as shown in Table II., is about 2.35 inches. These ordinates can readily be protracted (*see fig.*) to form



a diagram, and their tops joined with a flowing line, which will reproduce the original curve in a more regular form; or they can be treated arithmetically, as in Table II., whence those conclusions were drawn which were stated at the beginning of this memoir. I should add, that the precise mean difference of stature, &c., in the two groups of schools, is given by the units of area of the interval between the collated curves, divided by the units of length in its base, and that this area may be measured readily and accurately by the ingenious little instrument called a planimeter.

TABLE II.—COMPARATIVE HEIGHT AND WEIGHT OF PUBLIC SCHOOL BOYS, AGED FOURTEEN LAST BIRTHDAY.

| | Ordinate at 8th Division. | Difference between Grades. | Ordinate at 25th Division. | Difference between Grades. | Ordinate at 50th Division. | Difference between Grades. | Ordinate at 75th Division. | Difference between Grades. | Ordinate at 92nd Division. |
|--|---------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| HEIGHT. | inches. | | inches. | | inches. | | inches. | | inches. |
| Country Schools | 56.4 | 2.7 | 59.1 | 2.0 | 61.1 | 2.4 | 63.5 | 2.5 | 66.0 |
| Town Schools..... | 55.2 | 2.1 | 57.3 | 2.4 | 59.7 | 2.3 | 62.0 | 2.3 | 64.3 |
| Differences between Coun- try and Town Schools... } | 1.2 | ... | 1.8 | ... | 1.4 | ... | 1.5 | ... | 1.7 |
| Sum of differences between successive grades..... } | ... | 4.8 | ... | 4.4 | ... | 4.7 | ... | 4.8 | ... |
| Mean of above | ... | 2.4 | ... | 2.2 | ... | 2.35 | ... | 2.4 | ... |
| WEIGHT. | lbs. | | lbs. | | lbs. | | lbs. | | lbs. |
| Country Schools..... | 81 | 10 | 91 | 8 | 99 | 11 | 110 | 15 | 115 |
| Town Schools..... | 73 | 9 | 82 | 9 | 91 | 11 | 102 | 14 | 116 |
| Differences between Coun- try and Town Schools... } | 9 | ... | 9 | ... | 8 | ... | 8 | ... | 9 |
| Sum of difference between successive grades..... } | ... | 19 | ... | 17 | ... | 22 | ... | 29 | ... |
| Mean of above | ... | 9.5 | ... | 8.5 | ... | 11 | ... | 14.5 | ... |

NOTE.—According to Quetelet's "Anthropometrie" the average height of Belgian Boys at 14 is only 1.469 (= 57.8 inches), and their weight 37.1 kilos. (= 82 pounds).

After this long explanation, I can briefly dispose of what remains to be said. The reason why I could not compare other ages than 14 is to be found in the data given by Table III, which show that the numbers of the boys of the various ages varies considerably. There are only 99 boys in the country school group aged 12, but 265 aged 13; consequently the average age of the boys aged 12 certainly exceeds $12\frac{1}{2}$, and must not be taken at that figure. I have protracted the curves for all the ages, both for height and weight, and find the existence of this cause of error to be unmistakable. It seems, however, that we may neglect it as trivial in both groups at the

TABLE III.—NUMBER OF BOYS OF VARIOUS AGES IN CERTAIN PUBLIC SCHOOLS.

| | | AGE LAST BIRTHDAY. | | | | | | | |
|---------------------|---------------------|--------------------|-----|-----|-----|-----|-----|-----|-----|
| | | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| COUNTRY SCHOOLS. | Marlborough . . | 3 | 14 | 34 | 96 | 90 | 140 | 103 | 47 |
| | Clifton . . . | 6 | 43 | 34 | 65 | 93 | 99 | 80 | 49 |
| | Halleybury . . | ... | ... | 9 | 37 | 77 | 92 | 70 | 42 |
| | Wellington, in part | ... | ... | 19 | 46 | ... | ... | ... | ... |
| | Eton, 4th Form | ... | 1 | 3 | 21 | 36 | 16 | 3 | ... |
| Total . . | | 9 | ... | 99 | 265 | 296 | 347 | 256 | 138 |
| TOWN SCHOOLS. | City of London | 42 | 57 | 96 | 102 | 109 | 57 | 23 | 14 |
| | Christ's Hospital | 29 | 114 | 175 | 171 | 188 | 110 | 4 | 10 |
| | Birmingham . | 62 | 69 | 106 | 123 | 100 | 81 | 29 | 18 |
| | Liverpool College | 28 | 54 | 116 | 105 | 112 | 54 | 20 | 16 |
| Total . . | | 161 | 294 | 493 | 501 | 509 | 302 | 76 | 58 |

age of 14. It is true, that the town school figures show a great falling off at the age of 15; but I understand this to be chiefly due to the fact of many boys leaving between 15 and 16, rather than to a commencing diminution between 14 and 15. The run of the curves confirms this view. However, the error, such as it is, raises the country schools somewhat above their true level, and depresses the town schools; and it may be held accountable for an error in the difference between them of, perhaps, a tenth of an inch, or even a trifle more. Therefore, instead of the statistical result of 1·4 inch difference of height, as shown in Table II., it is better to say about one and a quarter inch. Similarly, the 8 lb. of difference might be reduced to 7.

The curves I have drawn for the different ages show a tendency in the town boys to make up, as they grow older, for their early deficiency in height, but they never reach the standard of the country schools. I, therefore, conclude that the deficiency at the age of 14 is partly due to retardation, and partly to total suppression, of growth. The weight of the taller boys in towns does not increase with their height in the same proportion as among the country boys; in other words, the tall town boys are slight.

As regards the dependence to be placed on the results, it seems justified by the number of cases observed, and by the fact that the curves of height (of course, not those of weight) conform fairly to the Law of Error, as has already been pointed out;

also, as already remarked, the curves of heights and weights for consecutive ages form as good a series as we have a right to expect.

In conclusion, I fear that the statistics, in the form in which they have been hitherto asked for, cannot be so worked as to give as just an idea as we desire of the growth of English boys under different conditions, and that it will be necessary to modify our schedule by asking with more minuteness concerning age.

DISCUSSION.

Mr. WM. HARDING said that it might be desirable to understand with some exactness what was meant by the author of the paper by "the town and the country boy;" that if a great city like London were selected, and boys born and reared within its meshes were given as examples, then the superior development of the country boy would be at once conspicuous from every point of view; that it was scarcely possible to make superficial observation without noticing that the children who fell to the care of guardians of the poor in the great metropolitan parishes were of diminished stature and almost stunted growth; and that, under like disadvantageous circumstances, the same may probably be the case in other large towns. But throwing back his memory to observations made during early and country life, and taking for illustration the boys from boroughs of from five to thirty thousand inhabitants, then to him the comparison gave this result, *i.e.* the country boy was heavier, stronger, slower, and of larger chest-girth than the town boy, but that, as a rule, he was *shorter*. The town boy, on the other hand, was lighter, more active, smaller in his chest development, but, as a rule, he was *taller*. The subject was of some interest and deserving of observation, because if the town boys were (as many suppose) really degenerating in stature, it opened out rather an uncomfortable-looking future, as, once establish a true degeneration, and the hereditary principle must step in and help to secure its permanence.

The PRESIDENT, Mr. CHARLESWORTH, and Mr. HARRISON having spoken,

Mr. GALTON, in reply to the remarks of the various speakers, saw no cause of objection, in combining, as he had done, all the boys who were 14 on their last birthday in a single group. Of course, some of them were only just 14, and others were nearly 15, and a few cases of very short, and of very tall, stature might be chiefly due to that cause. But statistics did not concern themselves with exceptions, but with the mass, and, in the particular form of discussion which he had adopted, both ends of the series—the shortest and tallest—were excluded. No doubt the town group includes several cases of boys of country origin; but the distinction of town boys in the town group, and of country boys in the country group, is undoubtedly the prevailing characteristic. It should be noticed, that in the pre-eminently town school of the City of London, the

boys' stature was the smallest. It was not maintained by Mr. Galton that the deficiency of size in the town group was altogether due to bad effects of nurture on the individual boys; on the contrary, he would be disposed to ascribe much of it to the town life of their parents, and probably of other ancestors; but these were subjects requiring more statistics than were before them at present, before they could be properly discussed.

The following paper was read by the author :

On the ORIGIN and PROGRESS of the PEOPLE of MADAGASCAR.
By JOSEPH MULLENS, D.D., Foreign Secretary of the
London Missionary Society.

IN recent years special interest has been taken by Englishmen in the people of Madagascar. For a long period a bitter persecution was waged against the few Christian converts in the island; they were found to be heroic and faithful, and at length, as the result of their steadfastness, suddenly a strange transformation of the chief tribes took place; the idols were burned, and the rulers, nobles, and inhabitants in the Central Provinces declared themselves Christians. Many friendly travellers have since visited them. A cordial interest in the growth of the nation has been shown by both the English and French Governments; the export and import trade of the island has steadily increased to about £500,000 a year, and the course of improvement has been stimulated in a variety of ways.

Many books have been written both about the land and the people of Madagascar. But just as the descriptions of the country and its maps were (till lately) derived almost entirely from the memoir and map of Colonel Lloyd, so to a very large extent the descriptions given of the language, history, and customs of the people have been drawn from the ablest work on the subject, the "*History of Madagascar*," in two volumes, written by the Rev. W. Ellis, in 1838. The time has come to revise these views of former days. As much has been added of late to our knowledge of the geography of the island, so, many things have become clear which were formerly obscure, in relation to the people. During a twelve months' visit to the island, I have had the opportunity of travelling over all the Central Provinces, and of seeing much of the people, as well as of hearing of their past history and present progress. I gladly avail myself, therefore, of the opportunity which has been kindly furnished to me by the President and Council of this Institute, to state to its members some of the conclusions to which I have been led respecting them.

The Malagasy people appear to me to be a single race. Not-

withstanding a tradition about "dwarfs," nowhere do we find any tribe, or clan, or race, in any secluded corner of the land (such as we meet with in the hill districts of India, of Sumatra, and of Borneo), totally different from the inhabitants of the plains or open provinces. Nor do we meet with any portion of the people specially degraded below their fellows as a conquered and despised race. So far as known, the people of the entire island are in most respects similar to one another, and, sixty years ago, they stood on a more common level than they do now. The main differences at present existing between one portion and another, are the results of Christian education, and of compact, just, and settled government.

There is undoubtedly one distinction which may be drawn among the Malagasy: they may be divided into the dark and the fair tribes. From the first, writers on Madagascar have referred to this difference between them. But in the face of important points of agreement, I think too much has been made of it. It is well known to residents in India that low, hot, saline, and malarious districts tend to darken the olive complexion; while dry, open, cooler plains, tend to bleach it and render it fair. Now, it is the coast tribes of Madagascar, inhabiting the hot, feverish provinces, which have the dark skin; while those which occupy the central plateau, with its bracing air, are, in general, fair. Other considerations must be looked to, and I find them in the dialects spoken, and the course taken by the movements and migration of the tribes, as they gradually occupied the island. In regard to these matters, several mistakes have been made by various writers.

Judging from the movements of the tribes, and from their present relations to one another, it seems to me that the Malagasy are divided into three tribes, starting from different centres and inhabiting separate districts. The BETSIMISÁRAKA tribe and its offshoots occupy the east coast and its two lower terraces. The SÁKALÁVAS hold the broad plains of the west coast in all its length, and overlap the upper extremity of the north-east coast. The HOVAS and their branches inhabit the entire central plateau, and the flanks of its southern extremity.

The BETSIMISÁRAKAS include the Sihánakas, the people of Ankáy, and (I think also) the Tanálas, all on the higher terrace between the lines of forest. These upper divisions of the tribe have separate names; but they are merely expressive of the localities to which the people have migrated. The Betániménas are those who occupy the "districts of red clay." The Tanálas are the people of "the forest districts." The Tankays live "in Ankáy," the "open land," not concealed or broken by long hills. The Sihánakas are "the people of the lakes." In no part of the

country occupied by this tribe is the population concentrated and numerous; all their districts are thinly peopled. Important mistakes have been made in regard to these subdivisions. Both the Sihánakas and the Bezánózáno of Ankáy have been described as Sákalávas. But a visit to the districts which they inhabit shows at once that with the Sákalávas they have nothing to do. They are shut off from the latter by all but impassable mountains. They are Betsimisárakas in their houses, their dialect, and the dressing of their hair, and an examination of the country plainly indicates the points on the east coast from which this people started. In regard to the still greater error of regarding the entire Betsimisáraka people as half-breed Arabs, there is even less to be said. The statement must have originated in some mistake. It might apply to a few people in and around the Arab colony of St. Mary's; but it is wholly inapplicable to the entire people of the east coast.

The SÁKALÁVAS are also divided into tribes; but there is little cohesion amongst them; they live separate from one another, and have frequent petty wars. Their numbers cannot be great, though they occupy a large tract of rich, tropical country, which, under a settled government, and in diligent hands, would yield vast quantities of produce. They have for ages been at feud with their Hova neighbours, ever ready to carry off their cattle, and plunder their farmsteads and fields. The name they bear, "the tall cats," is a complimentary title given by their Hova foes, who have found them as fierce and formidable with the ancient weapons as any wild cat to be met with in the country. The Sákalávas have not been slow to return the compliment; and they contemptuously style the Hovas *Ambóalámbo*, a mixture of "the dog and the bear," "a set of vagabonds."

The HOVAS proper now occupy all the northern portion of the central plateau, whether Vonizongo, Imámo, or other districts. And though, at one time, it was usual to describe their province as Ankova, in recent days the tendency has been to drop this term altogether, and to call the entire Hova country IMÉRINA. The BETSILÉO tribe are, without doubt, of the same blood as the Hovas. The IBÁRA tribe, who live south and west of the Betsileo, are, again, kindred to the Betsileo. Each of these sections of the central population has grown numerous, has had its separate interests, and has been at feud with its fellows. Nevertheless many similarities of language, dress, customs, and manners, exist between them, and the differences are not greater than those which divide them from the other tribes of the island. Politically, these tribes are drawing nearer to each

other under the Hova rule; and these similarities will be increased and developed rather than repressed.

In the important inquiry whence the Malagasy have come, and with what other branches of the human race they are connected, the evidence supplied by their language is of the first importance. Naturally it might have been expected that, living so near to the continent of Africa, they would be connected with the African tribes, or, at least, that some of their settlements would have been founded by African colonists. And among scholars there have not been wanting those who have argued warmly that they are substantially an African people. The views of the late Mr. Crawford on this point are well known. He argued that the Malagasy are substantially a Negrito people, with woolly hair, African blood, and an inability to form an alphabet; that Malay pirates, blown away from the east, had mingled with them and left their mark upon the language, and so on. Mr. Wake follows on the same side.

Even on theory it might have been objected that the African tribes are not navigators, and that the Mozambique channel, with its strong currents, and stronger south-east winds, must have been (as it still is) a formidable barrier against intercourse between these tribes and Madagascar. But, in point of fact, there is no tribe on the island (so far as it has yet been examined) which can be shown to be substantially African in its language, its features, its habits, its relations to its neighbours. There are pure Africans in abundance (as we shall see) scattered about in certain districts on the west, imported through the Arab slave trade. And the African element has tainted the original Malagasy race. But no original and distinct tribe on the island has yet been pointed out as long-settled African colonists; much less can the entire Malagasy people be identified with such a tribe. On the contrary, the three great divisions of the Malagasy hold together, embrace almost the entire island, and their language and tribal customs suggest a totally different direction as to their origin.

In illustration of this unity of the races now occupying Madagascar, I have noted with interest that the names given to localities in all parts of the island, Sákaláva, Betsimisáraka, and Hova, are of the same character, and are plainly derived from the present Malagasy language. Many of the Sákaláva names are distinctly Hova. Off the north-west coast we find Nosibe, "big island;" Nosikomba, "monkey island;" and Nosifály, "glad island." We have Ampásiména, "red sand village;" Márolahy, "the village of princes;" and Andrá-nomalaza, "famous water." We have Márovcáý, with its

"many crocodiles;" Mojanga, "the restorer of health;" and Mevatanána, "good place for a town." On the west coast we have Máintiráno, "the black river;" Mafándráno, "hot springs;" and Mámiráno, "sweet waters." We have one town, Mánandáza, "the glorious;" and another, Malaimbándy, "the place of indolent lies." We have Fierénana in Vonizongo, and on the Sákaláva coast. We have the pass of Ambodifia-kárana, among the limestone ridges of the Sákalávas; and under the granite moors on the Mania. Hundreds of names are scattered over the east and west coasts, bearing a striking similarity to those of the interior, and applied as fittingly to the places which they indicate. The names and the people are evidently one.

Baron Humboldt, the linguist, long since detected the Malay element in their language. Other writers have followed him. And the more attentively and completely the subject is examined, the stronger will the evidence of that origin appear. Unhappily, such a complete examination has not yet been made. Malay scholars have but partially understood Malagasy, and Malagasy scholars have looked but little into Malay, and we know scarcely more than was written, clearly and fully, by the Rev. J. J. Freeman forty years ago. Yet the materials are beginning to accumulate out of which the comparison may be made in full detail. Besides Marsden's "Grammar and Dictionary," in Crawford's "Malay Grammar," in Wallace's "Eastern Archipelago," in the Appendix of Dr. Turner's "Nineteen Years in Polynesia," there are lists of words and idioms in the Malay and its cognate dialects, Samoan, Máori, and Tahitian, available for the discussion of the question, and, ere long, we may hope to see it undertaken thoroughly. I have no pretensions to a knowledge of either tongue. But it happens that, during my visit to Madagascar, unpublished papers from competent men came into my hands, and I will venture to give a few illustrations which they furnish of the connection between the two languages. Mr. Freeman observes, with interest, that it is the Betsimisáraka edition of Malagasy which comes nearest to the Malay; and it is the Maláya branch of the language, rather than Javanese or Báli, which comes closest to Malagasy. Here is a simple list of twenty words:

| <i>English.</i> | <i>Malay.</i> | <i>Malagasy.</i> |
|-----------------|---------------|------------------|
| crocodile | buáya | voáya* |
| bone | tulang | taolang (Beta.) |
| fly | lalat | lálitra |
| fruit | búa | vón |

* The *o* in Malagasy is pronounced like the Italian *u*. This arrangement was a fatal mistake in the early writers of the language, and is calculated to mislead any one outside the island. Hova ought to have been written Húva.

| <i>English.</i> | <i>Malay.</i> | <i>Malagasy.</i> |
|-----------------|---------------|------------------|
| ground | tánah | táuy |
| grow | támboh | mi-tombo |
| hand | tangan | tángana (Beta.) |
| heaven | lángit | langitra (Beta.) |
| hang | gantong | mi-bantona |
| fear | tákut | tahotra |
| moon | bulan | vólana |
| stone | bátu | rátó |
| year | tahun | táona |
| spirits | túaka | tóaka |
| mosquito | nya-mók | móka |
| two | dúa | róa |
| four | ámpat | éfat-ra |
| six | ánam | énina |
| ten | sá-puloh | folo |
| twenty | dus-puloh | ron-polo |
| thousand | sa-riba | arivo |

In their structure and government the two languages resemble one another, but the Malay seems a less formed and complete tongue than the Malagasy. Both languages have the inclusive and exclusive pronouns, and the same form is used in the nominative and objective cases. In both reduplication is common. The prefixes through which the verb is conjugated, though differing slightly in form, constantly bear the same meaning in Malay as in Malagasy, and are used in the same way. In both cases the same sort of improvement was needed, and came from the same source. The Arab traders gave to each people the names of the days of the week and of the months of the year. The scales for weighing money are Arabic, *mizán*. The word for writing, *sóratra*, seems Arabic also.

Additional improvement to the Malagasy came from their intercourse with the French, who in the course of many years' visits to the coasts of the island, introduced new articles to their notice, which are still called by their French names. At least seventy French words have become naturalised in Malagasy, and that in a very curious fashion. The young Malagasy now sits upon a *seza*, in front of *látábat-ra*; his rice is brought from the *lákazy*, and he eats his beef with a *fórisét-y*. He wipes his face with a *mósara*, washes his hands with *sáona*, and dries them on a *sáriceta*. He keeps his clothes in a *lálámóra* (armoire), rides forth on his *soavády*, and wears patent leather *bóty*.

The colonisation of Madagascar by the Malay tribes is a topic full of interest, but we know almost nothing about it. It is singular, that in the very first mention made of the island, the celebrated notice of it by Marco Paolo, he should have made a strange mistake, and mixed it with information which belongs to the Somali country around Cape Gardafui. Madagascar has neither elephants nor hippopotami, neither leopards, nor bears,

nor lions. Nevertheless it is evident that the great traveller learned something real about the island, and of that aspect of it which was especially presented to the great sailors of his time, the Arab and Persian traders, whose fathers had visited it for many ages. Sandal-wood is still exported from the northern ports, and the Hindoos carry on "a profitable trade." I do not think that the people whom Fra Mauro speaks of as blown away to the southward were connected with the original settling of Madagascar by the Malays; the accident he describes seems to me of much later date than that settlement, and that it happened to Indian traders who were sailing down the African coast. When they were blown back again, they may have seen shells of the *Cerynthis*, on the sandy terrace at the south-east end of Madagascar, where M. Grandidier found both shells and bones. Fra Mauro does not say that they saw the living birds. Sinbad's additions about the elephants and the jewels are applications of "travellers' tales," and traditions floating about the nautical world long before his day.

That in early times there should have been a Malay immigration into Madagascar is nothing strange. Everything new which we are learning about the Indian Ocean and the China Sea tends to show how boldly and continuously those seas were traversed before the Christian era. Phœnician navigation, both from the Red Sea and the Persian Gulf, was ably carried out even in the time of Solomon; and the evidence is accumulating that their colonies, trading settlements, and ports of call were established along all the African and Indian coasts before the Ptolemies had ceased to rule. They had long since learned the regularity of the monsoons, and decided how to employ them. Zanzibar and its neighbourhood had become the head-quarters of the Central African trade, and every year a great fleet crossed the Indian Ocean from the ports of Guzerat and Malabar with the north-east monsoon. What was a twenty days' voyage before a fair and steady breeze to men accustomed to the sea in large vessels of three hundred and eight hundred tons, such as the Alexandrian corn-ships, or the buggaloes of the Gulf of Cutch, with their strong masts, long yard, and huge sails? To me it seems that they mastered the navigation early; its continuity was never broken till Albuquerque and Almeida took it with violence from their hands; and I venture to think that in the Arab merchants of these Eastern seas, with their Khojah friends in Western India, and the "old man of the mountain" at their head, we have the lineal descendants, in blood, and language, and employment, of the Phœnicians of ancient times. Able navigation was not confined to the waters of the Indian Ocean. We know how, before the Christian era, Hindoo mer-

chants and sailors traversed the Bay of Bengal, passed the Straits of Malacca, and had flourishing settlements, temples, and palaces in Báli and the great islands of the Java Sea. The Malay races in those islands had already proved themselves adventurous navigators. We do not know how early they left their mark on all the eastern kingdoms of the Bay of Bengal—on Ceylon, which was to them Pulo Selán, “the island of gems”—and at various points along the coasts of India, as far west as Guzerat. The Chinese, too, have not been behindhand with their well-built vessels, and the compass, which they first employed to direct them. Long, long were they at work before they had formed and perfected the enormous junks which so delighted Marco Paolo, with their well-caulked seams, their fifteen watertight compartments, their fifty cabins, their three hundred sailors, and numerous families of women and children, ready to undertake long coasting voyages, or even to run up the Straits to Ceylon, or visit the three ports of India which they loved, and from which they were driven only four hundred years ago. The very finest of these vessels belonged, not to the northern ports of China, but to the harbours of Siam. Among all the Hindoo and Arab vessels I have seen in Zanzibar, Calcutta, and Bombay, none equalled in size and strength of build the noble Siamese junks which I once found at anchor, after their summer voyage northward, in the bends of the Peiho. It is when these pursuits are in full activity that ability in their management is developed in its highest forms. And what more natural than that, among these Arab, and Siamese, and Malay navigators, there should appear from time to time men of genius to shape out new enterprises, or that among their chiefs and people there should arise another Prince Henry, or Queen Elizabeth, or Ferdinand and Isabella, to foster and encourage them.

Anyhow, there the Malagasy are—a Malay people, following Malay customs, some of them possessing Malay eyes, and hair, and features, and all of them speaking a Malay tongue at the present hour. When they came, where they landed, what hindered their return, we know not. Was some large vessel caught in a furious cyclone and driven ashore? Were the first colonists few or many? Did they communicate with their friends, and get others to join them? Were several settlements established at different points? Was the colonisation continuous? if so, over how many years did it spread? Did Malay navigation extend to the east coast of Africa? and are Zambesi, Kilimány, Mombása, Kiloa, Masambika, and other names there, of Malay origin, as Mr. Freeman suggested?

Judging from modern results, I incline to think that the

original colonisation was not extensive, that the trade was found not to be remunerative, while navigation so far to the south was found to have special perils, and that the connecting link between Madagascar and Great Malaya was early severed. The population has increased but slowly during these long ages. Even now the Betsimisáraka tribes in their five divisions only just exceed a quarter of a million; the scattered Sákálávas, even in their wide and fertile plains, contentious, and ever at feud with one another, cannot exceed half a million. The three Hova divisions are strongest in numbers, in civilisation, and resources generally, and yet amount to less than a million and three-quarters altogether.

Hitherto the various writers on Madagascar, in describing the population, have all followed Mr. Ellis's estimate of forty years ago. That estimate, amounting to 5,500,000, appears to me wholly inapplicable to the present day. It was very largely guess-work, and included districts which had then scarcely been visited by an Englishman. I speak of the population as (to a large extent) I saw it, and I estimate it as follows:—

POPULATION OF MADAGASCAR.

| | |
|--|-----------------|
| 1. BETSIMISÁRAKAS, including | |
| Sihánakas, 40,000 ; Tanálas, 20,000 ; Tankáys, | |
| 50,000 ; Ikongos, 20,000. | 300,000 |
| 2. SAKALÁVAS, north and south | 500,000 |
| 3. HOVAS and cognate tribes: | |
| Imerina and Vonizongo | 1,000,000 |
| Imámo and Mandridrano | 100,000 |
| Betafo and Vákin 'Ankárát | 100,000 |
| Betsileo | 300,000 |
| Ibára, &c. | 200,000 |
| | <hr/> 1,700,000 |
| Total | 2,500,000 |

The results at present produced show at least three independent movements in the settlement of the island. The Betsimisárakas have lived a quiet life on the east coast, quite independent of the other tribes, and have quietly spread up the hills into the Tanála, the Sihánaka and Ankáy. And they have preserved in simple fashion the rough tongue of their forefathers in Sumatra. Whether the Sákálávas are one people, or have sprung from more than one colony, north or south, we know not. They have had constant wars with their neighbours above the hills, as well as among themselves. A dread of their courage and skill in war has established between them and those neighbours a no-man's land of fifty or sixty miles in breadth. And their movements and their history seem to have been all along independent of others.

The only traditions and remnants of past history come from the Hovas, who also have been independent, and who, having found opportunities of development not possessed by their fellows, have come to the front among the Malagasy tribes. They tell us how their original settlement was in the south-east of the island; when commenced, how developed, lasting how long, they do not know. Results show that here they became a strong people, and, swarming off, they began to push their way up into the hills. Evidently they entered the upper plateau at its south-east corner; and, while the foremost of the tribe pushed on, other branches, gradually springing from it, and now named Betsileo and Ibara, filled in the districts behind. The advanced Hovas seem to have reached Imerina about 800 years ago. For perhaps 120 years they were on friendly terms with a tribe which they found there, if not actually subject to them.

This tribe they call Vazimba. In the present day they talk of them as their ancestors; in the idolatrous days, they were deified, and their tombs are still the most sacred objects in the country. Happily, the Hova traditions give us the names of seven Vazimba kings. These names are as genuine specimens of Malagasy as the Hova names themselves. The Vazimba tombs are of the shape and structure of the usual Hova tombs, though of rude work and rough stones. So far, therefore, as we know anything about the Vazimba, they were a true Malagasy people—there is nothing African about them.

After a while, the Vazimba and the strangers quarrelled. Contests arose, and the Vazimba were driven out of the province—"to the south-west," says the story, but that means "into the unknown." This superiority of the strangers, says tradition, was due to their use of iron. Whether they had iron while on the coast, whether their fathers had brought and retained any knowledge of its use, or whether they had learned it from their Arab friends and neighbours at Mátitánana, whether they had supplied themselves with iron-headed spears during their march up the Betsileo, or had only produced them, on arriving in Imerina, from the iron hills of Amóronkáy, it is now impossible to say. But in the assertion that they knew the use of iron, while their opponents had only spears of wood, there is nothing improbable.

They made Imerina and all the upper plateau their own; and here, for five hundred years, they settled down, and spread, and grew. They ate, they drank, they planted, they builded, they spun, and they wove. They married, and were given in marriage; they formed the iron hatchet and the iron spade; they cut down the forests, and built houses, well framed, well fitted,

with roofs that successfully shed the rain; they built villages and towns, surrounded them with deep ditches, and protected them with the cactus hedge. They grew into compact tribes, obedient to their chief and his appointed officers. The members of the tribe met in council, and, in the public assemblies, not only maintained their liberties, but developed the powers and the resources of their mellifluous language. They made war on their neighbours, or defended themselves against attack. Their kings cemented peace by marriage alliances. They made great feasts, and, though no poetry has survived, their orators could recite the traditions of the past, and their assemblies were enlivened with the dance and the song. Great heroes arose among them, like Rapéto and Ralambo, of whom wonderful stories went abroad.

Two hundred and fifty years ago the Malagasy not only began to be better known to the outside world, but light begins to be thrown upon their internal growth and condition. At that period we find the Arab merchants settled at three points on the coast, and a foreign trade steadily carried on. We find them on the east, at two points. At Mátitanana they have been settled long. They have written the Malagasy language in Arabic characters; they have taught the tribes the Arabic names of the week-days and the months; but they have made no converts.

As the first specimens of the rukh's egg were dug up here, it is possible that Sindbad's application of the old story may have been derived from some sailor who had visited the settlement. There was another Arab colony on the island above Tamatave, called by them Nosi-Ibrahim, now known by the French name of I. St^e Marie. Both these settlements, owing, doubtless, to the Portuguese invasion of the Eastern Seas, were in a state of decay. The third settlement, at what is now called Mojangá, had done better. It was more easily accessible; it was nearer to the head-quarters of the Arab trade at Zanzibar; it was on the lee side of the island, on a splendid bay; and both the Indian cloth trade and the traffic in slaves were carried on under favourable conditions. More than this, able men among the Arabs had watched their opportunities, had practically usurped the government of the locality, and, as the Sákalávas had no cohesion, they retained their power long. At this time, the trade of the Indian Ocean was breaking up. The Portuguese had built up nothing in the place of the power they had destroyed. The sea swarmed with adventurers. Captain Kyd and other English pirates made Madagascar their head-quarters, and French schemers were planning and contriving settlements on the sea-board, hoping in the end to obtain possession of the island.

From all these quarters the Malagasy people gained no help. Under God's care, in the quiet of the interior, they were making steady progress. It is evident from their traditions, that two hundred and fifty years ago considerable strength was accumulating in the community, broader ideas began to prevail, and efforts at closer union were put forth. Ralámbo stands first in the new line of monarchs, drawing the people onward. To him are attributed great advance in the care of cattle and the establishment of the Fandroána festival. His second son, Andrianjaka, in the days of Cromwell, founded Antanánarivo, on the hill, till then called Ialamánga. Sixty years later (about 1720), Andriamásinavalona, a man of large mind, brought the whole of the Imerina towns under his rule. He was a wise and thoughtful ruler, ready for great enterprises. To him is attributed the greatest engineering work yet executed in the province, the embankments of the river Ikopa, which prevent the annual flooding of the great rice-plain. His name is always mentioned in the public kabáries with profound respect. On his death his kingdom was broken up among his sons, but a hundred years ago all the twelve cities were re-united under Impoin-Imerina, the ablest monarch of that princely line. The border provinces, also, on every side, felt the weight of his strong hand: and his son Radáma, by hard fighting, long marches, and untiring energy, consolidated and extended the dominion on every side. Only the south-west Sákalávas and Ikongo remained independent.

Even then, with all their growing energy, the Malagasy nation was still young. Their cities were growing, the villages were becoming numerous, and, on the whole, peace was maintained. But it was often broken for a time, and the hollow valleys between the royal towns were still swamps full of reeds—a protection to each city against its neighbours. The rice cultivation was extending, but an immense area of the great plain was still occupied by these great reeds, high over head, thick, and all but impassable. It took three days to travel from the present capital to Ambohimanga, twelve miles to the north; the swamps were traversed in canoes, and enemies, with spears, might be encountered at any point, lurking in wait for prey.

In this brief sketch I cannot enter at length into the customs of these tribes. Their ancient warfare with the thin spear and round, hide shield; their cylinder bellows, and clay furnaces for smelting iron; their simple looms and spindles, have all been described and pictured by Mr. Ellis. With one thing, however, I was greatly struck—with their custom of giving over to the dead, in their large stone tombs, the dresses, ornaments, furniture, and possessions which were favourites while they lived.

And I remembered how the Malay tribes of Polynesia and the North American Indians have been accustomed to do the same. Another custom was to exhibit, by rows of cooking stones, or of bullock skulls on poles, the extent to which the funeral feasts had been carried in honour of the dead, and the estimation in which they were held.

The social life of the capital at the beginning of this century shows, in a very striking way, how poor, as compared with other nations, the civilisation of the Malagasy still was. Almost no European improvements had reached them, except the firearms which they had obtained from the coast, and which proved a powerful instrument in securing the consolidation of the kingdom. When Le Sage visited him, Radáma was a thorough Malagasy in his dress, his superstitions, his house, his habits. He was dressed in a lamba, and sat on the floor, to eat, with his hands, out of a silver dish. His people were the same, and when they met Le Sage, and gave him a royal reception as the English envoy, they were covered with silver ornaments, and shouted, and danced, and sang around the strangers with truly barbaric pomp and show. In mental grasp, and in their longing for better things, Radáma and his father were much beyond all this. Radáma was a gentleman in his manners—courteous, considerate, hospitable, and kind. Both kings were wise in council, energetic in action, eloquent in speech. Both were humane in purpose, though, in despotic hastiness, they were often cruel; both were truthful, straightforward, and truly anxious to improve. They were fine illustrations of the weaknesses of Madagascar, as well as of its native strength and native virtues.

Beneath the surface lay many proofs of the backwardness of the people. Life and property were insecure. There was much poverty; few incentives existed to active industry. The country was destitute of roads; systematic travelling and intercourse between the different parts of the country was all but unknown. To me, one of the most instructive illustrations of the state of the island, and of the relation of its people to the world at large, is furnished by an event which occurred at this time on the north-western coast. On more than one occasion, at the end of last century, the Sákaláva tribes had taken advantage of small vessels in calm weather; had seized them, brought them to land, and burnt them for the sake of their copper and iron. Gathering together hundreds of men, they had undertaken occasional expeditions against the Comoro Islands, and harried and robbed their people. But in 1816, they planned a great expedition against the fort of Ibo, near Mozambique, three hundred miles away. They gathered no less than two hundred and fifty canoes, containing 6,250 men, and set out on their expedition.

They were overtaken by a violent hurricane, and only sixty-eight canoes reached the African shore. That was in 1816; yet it reads like a page from "Robinson Crusoe," or a story from the South Sea Islands.

I need not pursue the history. With Radáma we have reached our own times; we have reached modern efforts, modern improvements, modern missions. Often has the later story been written. It is told by Mr. Sibree in his little book, and by Mr. Ellis, in his "Martyr Church," effectively and with brevity. Let us look at the people as they are. At first sight my colleague and I thought them backward; but the more we reflected on the past, on their complete isolation from the great world around them, the simple framework and the small attainments of their natural and social life so late as sixty years ago, the more thoroughly we appreciated the great stride in progress which they have taken in that brief period. Many officers of Radáma's day are still living, with their antiquated coats and antiquated notions, and till very recently they have much hindered change and trammelled advance. But solid progress has been made. It has been made in their outer life; but, best of all, it has been secured in far greater degree in their religious character and in their moral and social habits. Indeed it is a matter for special congratulation and thankfulness that it is that moral improvement which has come first, and that it is so deeply rooted and so widely spread. The external civilisation will follow quite rapidly enough.

In the form of their national life the Malagasy are still a federation of Malay tribes. Each of the greater tribes has numerous subdivisions, at the head of which are the noble families and princes descended from the great chiefs of former ages. Among these, the immediate descendants of the ancient kings of all the sections and cities of old times occupy an honoured place. The feudal rights, dignities, and privileges of these noble clans are carefully maintained, as well as their feudal duties faithfully performed. All the common ranks of the people are enrolled and included among the clients and followers of these inferior chiefs and princes, or among the direct followers of the sovereign. All payments for taxation within the tribes are made in kind, or in feudal service rendered. Officers are remunerated by lands, or by the assignment to them of the service of so many inferior men. Rice, sugar-cane, lambas, firewood, beams for building, bundles of thatch, stones, pork, beef, are all rendered to them and to their superiors as part of that service. Under the law of Rálambo, the rump of every ox slaughtered in the capital is delivered to the queen. On a message from the queen, asking for any special form of service, local meetings are

held by the clans to arrange as to the mode of distributing it. The term used to denote this system is *fianampôana*, which means, exactly, "service," and it bears all the variety and breadth of meaning which the English word had in feudal times. Though having in it just elements, the system has many weaknesses. It bears heavily upon the skilful, it is unequal in its demands, it represses progress by taking away all stimulus to self-improvement, or to individual enterprise. It keeps society on a dead level, and fosters indolence and indifference. It will only be cured by a fair distribution of the services required in all grades of society, and by a commutation of the service for a fixed money payment.

In regard to legislation and general government, the queen is the head of all the tribes. On great questions, public meetings of the tribes (*kabâries*) are held, discussions take place, and the sovereign pronounces the decision. The sovereign in this way enacts all laws. But they are declared verbally by herself, or some appointed officer (as we saw in the Betsileo Province), in public meeting, and the people and their representatives respond. Judges and magistrates, "heads of hundreds," and so on, are appointed to hear cases and complaints, or to examine criminals: they sit in the open market. Many improvements are coming into these arrangements. The laws have been codified twice by recent sovereigns, and have been put in print. The Malagasy have now a "prime minister," a "commander-in-chief," and a "chief secretary of state," called by the English names. And these officers, with a few others, form a kind of Inner Council, who consult together about public affairs. Formal receptions are held by the court, and affairs are conducted with dignity and good sense.

Apart from their religious instructions, the missionaries of the London Missionary Society have done a great deal to enlarge the general knowledge of the people, and elevate their family and social life. They have given them new instruments for material progress, that have already secured valuable results. They first systematically wrote down the language in the Roman character; and both by learning to write and to employ the press, the government and the people have made abundant use of the new power placed at their command. Mr. Chick, with his huge anvil and muscular arms, astonished the people by the larger forms of iron work which he could produce. Radâma admired him greatly. The native smiths and artisans soon copied their master. Carpenters, builders, masons, and spinners have done the same. Perhaps the most striking improvement which has been accepted on a large scale, is the adoption of the English dress. It took place during our visit, in December,

1873. With the approval of the people, the queen expressed her readiness to receive her subjects at court, dressed in English costume. The transformation was rapid, and the demands made in all directions for hats, bonnets, feathers, sprigs of flowers, and ladies' jackets, was very great. Higher wants than these are being felt, and in due time they will, no doubt, be supplied. Of these, roads are an important item, and the payment for service in money. And it is a happy thing, that by improving and elevating the customs and institutions of the country on their old lines, the stability and safety of the nation are secured.

Things are yet very backward. But the Malagasy are an intelligent people, an orderly people, a loyal people, a religious people. They have learned much already, and they are improving daily. They are governed by a good queen, and by wise and able officers. Under such influences, secular and sacred, Hawaii, with its sixty thousand people, has grown into a Christian nation, and has taken its place in the world's history. Far greater will Madagascar at length become, when elevated, sanctified, and ennobled in all the elements of its social and public life.

DISCUSSION.

Mr. GALTON desired to ask a question of some psychological interest. It was stated, that in or about the year 1868 a dancing epidemic, like the Tarantella, and the other strange manias, which are so well described in Hecker's "Epidemics of the Middle Ages," had prevailed in Madagascar. It was also stated that the form and progress of the epidemic presented strict and curious analogies with the others to which he had referred. Could Dr. Mullens corroborate those statements?

Mr. DISTANT said, without professing any Malay scholarship, he could but notice another resemblance between the Malagasy and Malay languages besides that of an occasional identity of words. He alluded to the use of symbolical expressions, examples of which, as used in Madagascar, had been given by Dr. Mullens, and recalled many instances of the same kind in the Malay language—such as "Mata-ari," which, denoting the sun, literally meant the eye of the day. The dissimilarity, however, in character seemed very considerable. As we had learned from this paper, there is in the Malagasy character an inherent strength and capacity for what is understood as civilisation, which will enable that people to withstand the shock of introduction of institutions and ideas belonging to a race more advanced in organisation and knowledge. The reverse, however, he believed, applied to the Malays, who have one trait rather strongly marked—a love of money, without a capacity to acquire it. There is scarcely a Malay who could refuse the offer of a loan, even were he not in want of it, and he will mortgage his property, and pay enormous interest for the same. The usual results follow; and if

ever the Malays are improved off the earth, "bill discounting" may, in those districts where some of the Chinese and Europeans have flourished, have proved an unobserved, but efficient agent.

Mr. J. PARK HARRISON thought it must be accepted as an anthropological fact that there was intercourse of some sort between Madagascar and the Indian Archipelago and Pacific, at a very early date. Dr. Mullens, however, whilst confirming the views of Ellis, Crawford, Oliver, and Pickering in this respect, differs from all these authorities in upholding a unity of race in the islanders. Distinctive features are daily becoming less conspicuous, and the earliest testimony is generally to be preferred. Not only, then, were there fair and dark islanders, but the lighter tribes are said to have been smaller in stature, and possessed of more perfect features than the others. One of the tribes used to plait the hair (which was black and glossy) in small knots, and manufactured wigs, like the dark races in Sumatra and some of the West Pacific Islands. Their funeral rites were also very similar. Drury, 150 years ago, relates that there were no priests amongst the people with whom he came in contact, but that it was the heads of families that killed animals in sacrifice. It seems probable that vessels of considerable size traded between Arabia and the South of Africa in remote times, and that Madagascar was mainly colonised from that direction. Dr. Pickering traced "Malay features," by actual inspection, from the shores of America (California), through the Pacific and East Indian Islands, to the immediate vicinity of Africa (Madagascar), and even found traces of them in southern Arabia and the borders of the Red Sea. Mr. Crawford thought it possible that some vessel, with Malays on board, was driven to Madagascar by the south-east monsoon, and that the people became incorporated with the islanders.

Dr. MULLENS, in reply, offered the following brief explanations. The Malay word for "two" is *dua*; the Malagasy is *roa*. There may be a connection between the Malay and the Latin in this case, because the Malay language was considerably affected in its original seat by the visits of Hindoo navigators two and three thousand years ago. Many Sanskrit words were introduced into it from that source, but the connection is accidental.—The dancing mania, referred to by Mr. Galton, was a real thing. It occurred in the Central Provinces of Madagascar in 1863, and has been fully described by Dr. Davidson. It was connected with an attempted reaction by the heathen party in favour of idolatry, and was thought by the native Christians to spring from real demoniacal possessions. Dr. Davidson thinks it was not merely an hysterical and artificial epidemic; there was real disease connected with it; fear and imagination did much to spread it. Only the heathen party took the mania; none of the Christians suffered at all. A later revival of it was discouraged by the authorities, and threats of punishment had a powerful effect in bringing it to an end.—The captivity of Drury has many points of interest connected with it. Drury was cabin-boy in an English vessel that was wrecked on the south-west coast of Madagascar, near St. Augustin's Bay. Owing to misunder-

standings, the crew were massacred, but Drury, being young, was saved, and kept in slavery by one of the Sákaláva chiefs. He was in slavery seventeen years, and finally escaped in another vessel. On arriving in England, he published an account of his captivity, drawn from his recollections, and very simply related. We know all about the Sákaláva people, whom he describes. Their language is closely akin to what is usually called Malagasy. They are one of the three chief tribes; they are one of the darker tribes, and have always lived on the coast, in low and feverish districts. I have already spoken of them. M. Grandidier resided at Tolia, near St. Augustin's Bay, and will probably tell us much about it in his forthcoming work.

The Rev. EDGELL WYATT-EDGELL and the PRESIDENT also joined in the discussion.

The following paper was read by the author :

On the QUISSAMA TRIBE of ANGOLA. By J. J. MONTEIRO, Associate of the Royal School of Mines.

I FIRST saw the Quissama tribe in 1859, and I have very often since been on the river Quanza, where for some years steam navigation with Loanda has existed, with the result of a large development of trade on that river and from the interior. The country of Quissama extends for a distance of about 120 miles on the southern bank of the Quanza, from its mouth to Dondo, beyond which place the Falls of Cambambe render it no longer navigable. Of the many tribes of negroes in Angola, that of the Quissamas is, perhaps, the lowest type of any, both physically and mentally. The Portuguese were first on the river about the year 1570, shortly after its discovery by them, and in 1595 they built the Fort at Muxima on the Quissama bank, the ruins of which still exist, and where they have a commandant and half-a-dozen soldiers. There is also here one of the oldest churches in Angola, containing an image of the Virgin Mary, which is greatly venerated, not only by the Quissamas, but by other natives even as far as Loanda. In former times the Portuguese missionaries had also several important stations on the northern bank of the Quanza, at Calumbo, Massangano, Cambambe, &c.; and although the missionaries ceased their labours years ago, the Portuguese have always existed on the river in greater or lesser numbers.

The natives of the northern bank, who speak the Bunda language, as at St. Paul de Loanda, prove to this day the good results of the great work of the former missionaries, being peaceable, and civilised to a considerable degree; mostly all speak Portuguese, and very many even read and write it.

Were not the Quissamas such an intractable race, the result of the former missionary teaching and civilisation would likewise be apparent in them; there can be no reason for supposing they were neglected, or not included in the labours of the missionaries, and it can only have been their great incapacity to receive instruction that has left them the savage and untamed tribe that we still find them, after 300 years of constant intercourse with the white race. When I say savage, I do not mean ferocious or warlike; they are the very reverse, being most cowardly and distrustful, and live in constant fear that the Portuguese or some native tribe will overrun their country and take possession of it. The Portuguese have never cared to occupy the Quissama country, or reduce the natives to subjection, as no object could be gained from it, the country, with the exception of a portion on the bank of the river from Massangano to Dondo, being so excessively arid and bare of water that the natives are obliged to make cisterns of hollow baobab trees, in which to store the water that falls in the rainy season. On the higher part of the river their country produces some palm oil, and the white traders at Dondo go, in the proper season, to the principal king of the Quissamas to settle the price at which it is to be bartered. The Libollos, or natives of the Libollo country adjoining the Quissamas to the east, are a very fine race, and although not so numerous as the Quissamas, have offered to fight the latter, and deliver their country to the Portuguese, if these will supply them with guns and ammunition. I was at Dondo when an embassy arrived from the Bailundo country to make an offer to the Portuguese to reduce the Quissama country if they were allowed to plunder, and carry off prisoners as slaves. This offer was refused, as nothing was to be gained by it. The Quissamas are a miserably poor and wretched tribe—are small, ugly, and excessively dirty in their persons and scanty clothing. The women wear only a kind of short skirt made of the inner bark of the baobab tree, and fastened round the loins (*see fig.*, p. 200). This skirt seldom reaches right round the body, part of the thigh being left exposed. With use, the skirt splits up into a bundle of strings, and gets black with filth, perspiration, and grease. The two dresses exhibited, I had to order to be made, as it was impossible to keep any I could get second-hand. The women in walking or running give a peculiar rotary and up-and-down motion to these skirts, and, not satisfied with Nature's liberality, attempt to improve on her by the addition of several extra layers of fibre on that part of the skirt which falls behind. The larger dress is that of a full-grown woman, the smaller, one of a young woman, girls and children not wearing any clothing at all.

The men wear a waistcloth of fine native matting, or of cotton cloth obtained in barter from the traders. These cloths are generally dyed a dirty black by being soaked in the juice of a wild indigo plant, mixed with a black ferruginous mud from the river. The women use large, open, conical baskets, with a flat side to fit the back and suspend by a band round the forehead, in which they carry produce, &c. (*See fig.*) It is the only tribe anywhere in Angola or on the West Coast that I know to use baskets in this fashion. The Quissama women, like those of



This illustration represents Quissama women pounding mandioca roots into meal in a wooden mortar, and sifting it through a kind of bottle-shaped sieve into an open basket. To the left is a woman carrying a basket on her back and a hoe in her hand.*

other tribes, cultivate the ground, and grow mandioca root, beans, and Indian corn; but their principal food is a small fish called "cacusso," which is very abundant in the river and lagoons, and which they catch with cast net and in fish baskets made like our eel traps. The Quissamas have no cattle, and but few sheep, goats, or fowls. They collect wax from hives they keep in the branches of trees, especially the baobab tree. With this, and palm oil, fish, &c., they constantly cross over to sell or barter to the white traders and the more civilised natives on the north bank; but they are such a suspicious and distrustful race that they never delay longer than necessary, and always return before nightfall, although they have never been ill-treated, nor have they any reason for fear of any kind. The Quissamas are not cannibals, nor do the women ascend the palm trees to collect the juice or wine, which everywhere in Angola is man's

* The wood block for this engraving, from Mr. Monteiro's forthcoming work on "Angola and the River Congo," has been kindly lent by the publishers, Messrs. Macmillan & Co.

work. They will not allow whites or blacks to open stores for trade in their country, nor will they deliver up slaves who run away into their country from their masters on the north bank. Formerly thousands of slaves passed through the Quissama country from Massangano to Benguella Velha, where they were shipped by the Spanish and Portuguese slave dealers, and I knew several Portuguese who, in other times, had often accompanied caravans of slaves through the Quissama country, and who described it to me.

To the south of Muxima there is a salt mine that I believe has never been visited by a white man, and the Quissamas cut the rock-salt in small, long, polygonal blocks about the size of a thin scythe-stone, and pointed slightly at the ends. These are closely enveloped in flat cane work, and when I first was on the river in 1859, were much used as money amongst the natives. They are now scarce; but the most singular circumstance connected with them is, that the newspaper correspondents accompanying the Abyssinian expedition described exactly the same kind of salt blocks as passing as money in the interior of that country. A little above Muxima there is a high cliff overhanging the river, called the "Fetish Rock," and from which their criminals, and those condemned to death for witchcraft, are thrown into the river. They are said to be previously stunned by a blow on the head, that they shall not escape being devoured by the alligators that swarm in that beautiful river.

Mr. MOGGRIDGE, by permission of the President, spoke on the destruction of the New Forest. The meeting then separated.

MAY 11TH, 1875.

Colonel A. LANE FOX, *President, in the Chair.*

The minutes of the previous meeting were read and confirmed.

The election was announced of SAMUEL DAVEY, Esq., of Monkswell, Windmore Road, Bromley, Kent.

Thanks were voted for the following list of presents:—

FOR THE LIBRARY.

From the SOCIETY OF ARTS AND SCIENCES, BATAVIA.—*Tijdschrift*, Vol. XXI. Nos. 3 and 4; Vol. XXII. Nos. 1—3. Notulen, Vol. XXII. Nos. 1—3, 1874.

From the CANADIAN INSTITUTE.—*The Canadian Journal*, Vol. XIV. No. 4.

From the SOCIETY.—Proceedings of the Royal Society, Vol. XXIII. No. 160.

From the SWEDISH AND NORWEGIAN LEGATION.—Official Statistics from the Royal University of Christiania.

From the ASSOCIATION.—Transactions of the Social Science Association, 1874, Glasgow.

From the SOCIETY.—Annuario della Società dei Naturalisti in Modena.

From the ASSOCIATION.—Journal of the Royal Historical and Archaeological Association of Ireland, No. 20, 1874.

From the SOCIETY.—Proceedings of the Royal Geographical Society, Vol. XIX. No. 4.

From the ASSOCIATION.—Proc. of Geologists' Assoc., Vol. IV. No. 2.

From JAMES BURNS, Esq.—Human Nature, for May, 1875.

From the EDITOR.—Revue Scientifique, Nos. 44 and 45, 1875.

From the AUTHOR.—What am I? By E. W. Cox. Heredity and Hybridism. By E. W. Cox.

From the EDITOR.—Nature (to date).

The following paper was read by the author :

On MYTHOLOGY. By MONCURE D. CONWAY.

THE subject upon which I have to submit some statement this evening being a very large one, it may, perhaps, be well enough to say that in no case could I have aspired to deal with it comprehensively; and as, in view of the interesting subject which is to succeed, I shall endeavour to condense what I have to say into as short a time as possible, I fear that some points that I desire to make have the appearance of generalisations, insufficiently supported by facts. I beg only to say that, in each such case, the facts and authorities are much less limited than the moments I can venture to occupy.

First of all we are met by the problem of the evolution of deities, and of the myths with which they are invested. In this direction, the study of comparative mythology tends to correct an impression to which most persons have a bias, and which the analogy of physical evolution at first glance appears to confirm. From early life we have impressed upon us the gross and grovelling character of the objects worshipped in what are called Pagan lands, the stocks and stones, animals and trees, of their idolatry being themes of religious horror. The ordinary process of evolution from lower to higher might suggest that human worship originated in the adoration of such base objects, and gradually ascended to grander objects—such as the elements and the heavens—just as man begins with a flint flake, and ends with a Sheffield knife. There is reason to believe that religious evolution has been the reverse of this, that it begins in the

terror, awe, and admiration awakened by the splendours and the vaster powers of nature—chiefly by the phenomena of the heavens and the play of the elements—and that it was only gradually that certain small earthly objects came to be held sacred, and then only by association with the grander objects. It is doubtful whether any savage ever worshipped the stock or stone in itself, and certain, that if he did so, it was only because the origin of its sanctity had been lost. In zoological mythology, the sacred animals are connected each with some deity. For instance, the little red beetle, called in India *Indragopas* (protected by Indra), is honoured as the little cow of God in Russia, St. Lucia in Tuscany, St. Michael's chicken in Piedmont; in Germany, little bird of God, little bird of the sun, little cock of Mary, and so comes to be our lady's bird, or ladybird, in England. The sanctity of the Egyptian Scarabæus was, no doubt, just as high in origin. The sanctity of flowers, weeds, bushes, trees, of which I have collected many hundreds, bears either in their names, or the fables associated with them, traces of a like origin, as symbols or oracles of higher things. Many of them have passed from religion to religion, bearing a mystical significance: as the toolsee, worshipped in India; a magical plant in German lore, as Sweet Basil; and our common St. John's Wort (*Hypericum Androsæum*—*αἷδος αἶμα*—blood of man), and whose red juice symbolised the blood of the slain Baldur, declined among newly Christianised peasants to "elf-blood," then rose to represent the blood of the beheaded John, under the name of St. John's Wort, the famous charm against witches. So also the flowers named after the Madonna—as lady's glove, lady's slipper—once bore Freyja's name. It may be noticed that whenever plants in remote districts are gathered for magical potency, as charms or medicines, it was essential that they should be gathered at certain holy times of the year, or under a particular phase of the moon, these being survivals of their ancient connection with celestial phenomena.

We may, then, conclude that religion has the high origin indicated. As the palæontologist knows how near to each other may be forms which have widely different functions—how easy, for instance, it is to confuse the bone of an extinct reptile that crept in the mud with that of a bird which soared in the air—so the student of mythology has to learn that phenomena, widely different in manifestation, may belong to one species. Sun-worship and serpent-worship, for example, cling together as closely now in Dahomey, where snake-worship is allied with the fire ordeal, as of old in Egypt, where they combined to form the symbol of the snake-winged sphere.

Another principle of importance which comparative mythology

appears to verify, is, that the original worship of mankind did not refer, or only gradually referred, to the moral qualities of the powers they worshipped. The phenomena, when personified, possessed the mixed character of the facts and forces of nature, part good, part evil, benevolent or malevolent, according to their mood, or as they were offended or soothed.

In the Rig Veda, the Marüts, or Storm Gods, are called the "allies" of Indra. The Hebrew Yahve says, "I create light, and I create darkness; I create good, and I create evil." We do not meet with any devil in the earliest mythology, and this plainly because no devil was needed. The deities were quite equal to any evil-doings that had to be accounted for. Even after the work of detaching the benevolent from the malevolent forces had progressed far, we meet for a long time only with demons—not with a devil, or a being who is wicked simply from love of wickedness. The demons—whether dragons, genii, or what not—have a motive. They are personifications of hunger, thirst, burning heat, intense cold, disease. Each of these is detached from a deity, or an *Abgott* (ex-God) as the Germans say, and they often bear traces of the estate from which they have fallen, either in their names—as Lucifer, Belial, Loki, names of light—or in the lameness received by their fall from heaven.

Mythology is thus a sort of banyan growth; its branches grow from above and take root in the earth. To explain its forms we must generally look above them rather than beneath. Let me dwell for a moment on an instance in which, as I think, neglect of the principles stated have led to error. We have heard a good deal of the Devil-worshippers, or Yzedis, who are supposed to worship a devil exclusively on the principle that he alone can have any disposition to do them harm, or can require to be propitiated. The probability is that the Mussulman calls the Yzedi a devil-worshipper only as the Zoroastrian held the worshipper of a deva to be the same—*deva* meaning, to the Zoroastrian, *devil*, to the Hindoo, *deity*. The chief object of reverence to the Yzedi is the *Taous*, a mythical peacock. Prof. King, of Cambridge, has traced the *Taous* of this Assyrian sect to the phoenix described by Herodotus (ii. 73) as burning itself on the altar of the sun in Heliopolis every hundred years, that another might rise from its ashes. Now the name Yzedis is simply genii, and we are thus pointed to ancient Arabia, where we find the mythical bird *Rokh*. There also we find Mohammed denouncing a popular belief in a bird called Hamâh, which was said to take form from a drop of blood in the brain of a dead person, and fly away—to return, however, at the end of every century, to visit that person's tomb. It would appear, then, that

devil-worship has been foisted on these people as an epithet that their belief represents an early form of animism and the doctrine of immortality; and though they may now accept the epithet—as the Friends consent to be called “Quakers”—they represent no such thing as the worship of Satan. How strong the old phoenix or *Taous* myth is, even among the Mussulmans themselves, may sometimes be detected by an observant traveller,—like Dr. Leitner, for instance, who found this peacock-shaped lamp in a mosque, where it ought not to have been, after the curses Mohammed heaped upon the form.

In one sense, Mythology is a kind of “fossil poetry”—to remember a phrase which Emerson applied to language. Any one who reads the Vedas or the Avesta will recognise in their imaginative phase the forms which in later periods hardened from ideals to idols. When the various colours of Dawn are compared to steeds, or clouds to cows or dragons, in the early books there is a lack of any such precision as is indicated in a mythology. The metaphors shift and change, they are applied now to one, now to another phenomenon; and it must have been in an age which invested such utterances with literal inspiration and verbal infallibility that the luxuriant growths were petrified into the material of mythology. I say the material, because the poet has to step in again, and again invest with ideality the rigid form which his ancient brother's metaphor has assumed in popular superstition. As Indra (the sun) with his steeds of light reappear as Apollo with his chariot and horses; as he, the divine slayer of the serpent Ahi, returns again as slayer of the Python; we note that things vague in the earlier have become clear cut, so to say, in the later form of the myth. We know various details about the Python which we do not know about Vritra or Ahi, the monsters whom Indra slew, the incidents of the combat, and there is now a woman in the case. The whole thing has alighted out of cloudland. It is not only more realistic, but more complex, various other myths having blended with it. It is difficult to weigh the various forces which operated to bring about such results as this, which are numerous; but chief among them we may discover political and ethnical influence. It is pretty clear that certain groups of deities, like the triad of Egypt and that of India, were brought about by the amalgamation of provinces, the equality of their chief deities being a condition of their national unity. The union of states may be represented, too, in the intermarriage of gods and goddesses. Myths grow also through religious rivalries. The priest no sooner hears of a big story told about a rival deity than he plagiarises it to add lustre to his own deity. Thus in the case of Apollo: he seems to have been originally a local divinity of the

shepherds of Arcadia, and was raised in importance by the Dorians when they conquered the Peloponnesus. However, during the opening of communications with Egypt, all the characteristics of Horus were added to him. The glories of Helios were transferred to him. We can see, nearer home, how such a force as this operates in the transfer to the Madonna of the stories which European pagans once told about their goddesses Bertha and Freyja, and in the inheritance by Saint George, Saint Michael, and other saints, of the dragon-slaying renown of Oriental deities. The material being thus quarried in many regions and brought together, the poet would again step in to build them up into the architectural symmetry and beauty which are so striking in mythologies. For the larger part of their immortality the gods and goddesses are indebted to the singers of the Vedas, of the Eddas, to Homer and Hesiod. In their poems we see, as an array of bright and beautiful forms, what, to the ignorant of their time, were probably rude and coarse idols. There is no limit to the power of poetry. Let theology give him a snake to work upon—a mere poisonous reptile, held in awe because of the deadly and mysterious danger which he seems entrusted to bear, and which must be propitiated—and the poet will detect in the reptile an occult symbolism. His coil is the circle of eternity; his spots correspond with the stars; his passing from skin to skin is the renewal of youth; his motion without legs the peristaltic movement of the universe; his forked tongue is inherited from the forked lightning. If this is the accumulation of poetic touches, resulting in the sanctity of the serpent, which sends it to support Vishnu in his starry repose, or whisper wisdom to Esculapius, to Athena, or to Eve, we need not wonder at the splendour of the ideals which priests have always been pulling down from the clouds to do ecclesiastical duty on earth, and which poets have always been raising up again, to shine with their original radiance.

My general statement of the genesis and evolution of mythology then is, that it begins in the higher phenomena of nature as they affect the human imagination;—not always in the sun, whence some seem to derive every myth, but from sun, night, eclipse, cloud, star, lightning, tempest—all high and wonderful things; that expression in human language begins their association with earthly objects, so that the rain-distilling cloud is called a milk-distilling cow, and so on; that fear, theology, the priest, harden the metaphors into a religious machinery; and that when this machinery begins to wear out, or more efficient machinery is invented, poetry and art take up the old forms, and re-translate them into mythology, or final apotheosis.

It follows, then, that every mythology represents the wreck of a religion. But while, whenever an ancient system which had been associated with the moral and social life of a people goes to pieces, it is only in such literary and artistic form that it is preserved as a whole; there is a popular form in which its various fragments survive, and they are scattered through the world as popular superstitions and folk-lore. I do not mean to go far into the large subjects of survivals, but may, in conclusion, note the persistence of religious fables as among the best aids we possess for the recovery of the unwritten history of primitive man. It is almost a compensation for the evils of superstition, that in its notion of the preternatural potency of certain phrases, runic rhymes, and its sense of the importance of exactness in transmitting details, it has given to innumerable fables a hardness and stamp quite as enduring as an arrow-head. True it is, that detached from the great system to which they belonged, subjected, in the ebb and flow of time, to the friction that wears away their outline, these fragments from alien formations require careful scrutiny in order to locate them rightly. For instance, when an English boy in the country greets the fall of snow with the cry, "Mother Hubbard picking her geese," or the more orthodox German lad cries, "Mother Holla shakes out her feather-bed," we arrive easily at a survival of the ancient German belief in Holla, or Huldah, goddess of housewives. But this goddess had various names, and the chief one was Bertha, more anciently Berchta, or Perchta, which may be related to *πυρ* (fire). This goddess, the shining one, inherited the swan fables from the East. The light, fleecy clouds floating in the sky, apparently around the sun, were described in early Eastern poetry as swans, and in the end as attendant nymphs. Thus in the "Dhaurmapada" it is said: "The swans go on the path of the sun; they go through the ether by their miraculous power." By a process which may easily be imagined, it became a belief that these celestial swan-nymphs sometimes appeared in the disguise of human beings; but they might occasionally be detected through some little feature resembling a swan. Out of this grew a species of legend, which may be found given in a popular form in Buddhagoshā's parables, where the virtue of modesty, and the wisdom of looking beyond appearances, are impressed through the story of a king of Benares, Likkhavi by name, who became enamoured of an humble village girl, because, as he observed her from his window, he noticed some little instance of her scrupulous modesty. She was quite homely, and, especially, she had large hands. Yet the king married her, and she bore him a son, who became famous for his wisdom and greatness. The large

hands correspond with the large feet of Bertha, and both refer to the webbed foot of the swan. The story of Queen Bertha came to her, probably, as an inheritance from the swan-attended goddess, simply because of her name. After all her sad adventures, King Pepin meets her in the Bavarian forest, where he is hunting. She has been reduced to become a servant in a miller's house, where the king stops. She is called "Bertha of the big foot." The king marries her, and their first son was the great Charlemagne. There are one or two representatives of this queen in Europe displaying a distinctly webbed foot. Connected with the same myth is the proverbial rustic saying in Germany, concerning any woman supposed to be a witch, "She has yellow slippers"—the allusion being to the yellow feet of the swan. And this phrase, the rune about picking geese or shaking out feather-beds by Mother Huldah when it snows; perhaps, too, our Michaelmas goose; certainly the big or webbed foot of Charlemagne's mother—the swan-legends scattered throughout the great drift of European folk-lore, including that graceful swan now drawing the chariot of Lohengrin at Covent Garden, may be traced back to the myth of "Circe and the Syrens," "Zeus and Leda;" these in turn being only the forms in which superstition first, and finally art and poetry, preserved what originally were Vedic hymns, in which Agni and the Maruts, the fiery and the dark clouds, were compared to swans floating on the sea of azure.

The method of studying mythology, however difficult in its application, is in itself simple. The fable is out of its place when it is inexplicable by the environment where it is found. We have to try and fit it in here and there until we find a formation which completely explains it. A striking instance of the impossibility of understanding a myth out of its place is supplied by the long puzzle about the serpent in Eden, transmitted from ancient Rabbins to modern theologians. The curse on the serpent, that it should always crawl in the dust—as if that had not been its nature previously—has been dealt with in various speculations; from the Rabbins, who said that the animal was previously shaped like a camel, to Dr. Adam Clarke, who thought it may have been a monkey; and recently, Mr. Fergusson, who explains the curse as an anathema on serpent worshippers. But the whole story of Eden, the tree of immortality, the serpent and its wisdom, is inexplicable by any Shemitic analogues. It is a boulder which has floated away from the great Aryan rocks. It is in India that we find the tree of life in the Meru paradise, the effort of the serpents to obtain the ambrosia of the gods—that great episode of the Mahābhārata—the transformations of demons or rival deities

into serpents, and their consequent supernatural wisdom; it is in India that we find all this class of myths. It is in Persia, Greece, Scandinavia, Germany, that we find their manifold modifications; they are the common currency of the Aryan race. The curse on the serpent, that it should crawl on its belly in the dust, has a very simple meaning for a race that believed in transmigration—that every animal form contained a soul on its way to higher forms, to whom the most terrible doom would be nailed for ever to one low form, and to the dust. There are various reasons for believing the Hebrew book containing this story, though printed first, to be comparatively a late one in its present form; and we may feel assured that such a narrative as that to which I have alluded could not have been there given, except after the Jewish race had become familiar with Aryan races. The unexpectedness of the place in which the legend is found, and the unquestionably Aryan character of each broken bit which has been thus pieced into a consistent story—which is as foreign to its place as a mosque would be in Trafalgar Square—combine, as I think, to illustrate the method which comparative mythology must employ, and the kind of certainty that can alone be considered satisfactory.

In a certain sense a myth is immortal; but its immortality, like that of Zithonos, is unaccompanied by the gift of perpetual youth; and as Zithonos, shrivelled with age, was, in compassion, changed to a grasshopper, even so it is, in the small forms of popular traditions, that the once majestic ideals of the world chirp around us. But their chirping is still the voice of nature, and their withered form still tinted with the hues of earth and sky. The student of mythology, as he reads in his paper the casual paragraph headed "Singular superstition," recognises in it the epitaph of some religion which once swayed the hearts of millions, and guided the destinies of empires.





DISCUSSION.

MR. BOUVERIE PUSEY said, in reference to Mr. Conway's remarks on the Yzedis, that the account of their origin in Kremer's "*Geschichte der herrschenden Ideen des Islamis*," seemed to him to be historically exact. From it he gathered that the Yzedis were founded by Sheikh Adi, a teacher belonging to the mystical sect of the Sufis, pantheists who believed, like Goethe and Emerson, that everything is a part or emanation of God, and, therefore, good. The devil, therefore, is good, being an emanation from God, and it is wrong to say, "Cursed be Satan," as the Mussulmans say when a horse casts a shoe, or any other misfortune happens. This point of Sheikh Adi's teaching naturally impressed the populace of both sides, and the two or three Kurdish tribes who adopted his doctrine were considered personal friends and worshippers of Satan.

MR. J. JEREMIAH said that he quite agreed with Dr. G. W. Leitner, when he said that mythology is not made of the "wrecks of religion," but that religion sprung into *activity* coeval with the origin of mythology. The speaker thought that in the study of comparative mythology we should arrive at something like a satisfactory position if we carefully examined the details of local mythologies. For instance, we have a few facts in connection with what may be called Keltic Mythology that must not be disregarded, although there is a feeling abroad that the Keltic lore of the country, and especially of Wales, is comparatively worthless. To show how important the study of Welsh myths is, Mr. Conway referred to the beautiful legend of the Swan in the opera of *Lohengrin*, and mentioned its vanishing from view after doing service to mankind. The speaker understood him to say that the *vanishing* of the swan is found in the legends of India, stamping it as Aryan. Well, singular to say, the *vanishing* of the subject of legend occurs in the charming Welsh legend of the *Milk-White Milch Cow*, which relates that the milk-white milch cow gave enough milk to every one who desired it. The persons who drank her milk were healed of every illness, fools became wise, the wicked became happy. This cow went round the world, conferring benefit upon mankind. After traversing through the Island of Britain, she reached the Vale of Towy, in Caermarthenshire, where, tempted by her fine appearance and condition, the natives sought to kill and eat her; but, just as they were proceeding to effect their purpose, she *vanished* from between their hands, and was never seen again. The question, then, to bear in mind, is not so much in relation to the *swan* exclusively, but from whence did the *vanishing* of animals and human beings spring—in the homes of the Aryans or the pre-Aryans? Mr. Conway had also alluded to the winds of heaven occupying a prominent place in Aryan mythology. In the Welsh mythology, we find that the wind is curiously treated. The milky-way has *eleven* names in Welsh, with very interesting and puzzling legends attached to some of these. He should not trouble the meeting with an enumeration of them; but as regards the "wind," two of the names are *Llwybr-y-gwynt* (the track of the wind), and *Heol-y-gwynt* (the road of the wind). It is said, and believed in in some parts of Wales, that the observed path of the milky-way on any given night indicates that the wind will blow in that direction the following day. But in Hampshire they say, the wind will blow at *right angles* to that path. Here is the difficulty—which is the older, the Welsh or Southern English? As the Scandinavians called the "way" the "Road of Winter," he was inclined to ascribe its greater antiquity to the Welsh, as the Northerners are known to have made incursions into South Wales, and it is in that part of the country he found the tradition more prevalent than in North Wales. Yet it may not be purely Keltic, but a development of the Scandinavian idea, although the Irish have no wind legend in connection with the milky-way. They call it *Bothar-bo-finn*, the road of the White Cow, or, the road of the Finn's Cow. There is no other name in Irish than this. Assuming the Gaelic to

be a purer form of the Keltic than Welsh, our study of the legends of Finn, white cows and oxen, &c., will result, he felt sure, to the advantage of comparative mythology. What is worth remarking is, that the Irish do not look upon the milky-way as a *weather prognostic*.

Mr. HYDE CLARKE observed that an Aryan origin is quite inadequate to account for the mythological phenomena cited, which evidently belong to antecedent epochs. The astronomical phenomena referred to by Mr. Luke Burke and Mr. Haliburton were known in the prehistoric epochs, as is proved by the wide distribution of legends in relation to them. One key is that proposed by Mr. Haliburton, and which opens out much of the symbolism. Thus in the middle of November is the following conjunction :—

| | | |
|---|----------|---|
|  | Pleiades | 7 |
|  | Ball | 5 |
|  | Orion | 3 |
|  | Dog Star | 1 |

This is the period of the new year, and of the feast of the dead of many nations, and is, undoubtedly, connected with one system of a prehistoric and existing calendar. There is consequently a mysterious series of 7, 5, 3, and 1. The stars in the Pleiades form a kind of cross, which is related to the Tau. This is connected with the T-marking of the wings of the Scarabeus, and which myth is represented in the ladybird, quoted by Mr. Conway. The series of the Pleiades also contains a 3, Triad, or Trinity, of the sacredness of which number it perhaps affords the origin. Mr. Conway's suggestion, that a Trinity represents always an alliance of national gods, cannot represent the general law, because some trinities consist of associated objects, and where a trinity is personified, besides a male and a female there is generally a chief god, who may be a generator, and thereby unites both sexes. At all events, mythology is a continuous development, although from time it has acquired special national types. With regard to the alleged devil-worship of the Yzedis, they certainly treat Sheitan as Melek Taous (King Peacock), and avoid the common references to Sheitan.

Mr. CONWAY thought that the comments which had been made on his paper were not such as to require any extended reply. He was, indeed, disposed to welcome the contributions to the subject which had been made by various speakers. With reference to the explanation of the so-called devil-worship of the Yzedis which had been offered by Mr. Pusey, he could not but suspect

that their optimism is referable to the later and rationalising phase of the religion, and that the worship of the "Taous," so plainly related to the "phœnix" of Herodotus, belonged to the earlier and pre-theological phase. He (Mr. Conway) could also agree to the geological illustration of mythology which had been used by one of the speakers, but thought that mythologies themselves, in their completed forms, must be regarded as the later strata of religions. A Greek writer, whom we may regard as a religious conservative, had contemplated with satisfaction the tortures which he believed the poet Hesiod was undergoing in the realm of Hades for the stories he had related about the gods. Our Greek mythology, in its present condition, comes mainly, perhaps, from Hesiod, and we may feel pretty sure that the poet would not have been able to make so free with the gods until they had begun to fade out of popular belief. Mythology is a dramatic expression of religion, and gods and goddesses are dramatised only when they have ceased to be formidable realities to the popular faith.

Mr. Brabrook read the following paper for the author :

LANGUAGE and RACE. By REV. A. H. SAYCE, M.A.

THE fallacy that language is a sure and certain test of race is one to which few comparative philologists would nowadays commit themselves. There is no assertion which can be more readily confronted with history, or, when so confronted, more clearly be demonstrated to be false. Language is no physiological necessity; it is not one of those physical marks which characterise race, and, like the colour of the skin or the shape of the skull, are inseparable from a man. We cannot help having hair of a particular character, or even, perhaps, a disposition of a particular kind, but we *can* help having language. A man may never speak all his life through, may never have the opportunity of speaking, but he will none the less be a man. We can easily conceive of a race of deaf-mutes who never make use of language in the ordinary sense of the word; indeed, the opinion is gaining ground among the students of philology that all articulate language has originated out of a previous gesture-language, which, of course, is the same all the world over, and could constitute no *differentia* of race. But, though language is no mark of race, it is a mark of society. Even the most rudimentary society could not exist without it; certainly no civilised society could do so. It is social in its origin and nature, the creation and mirror of society, as well as the bond that keeps society together. Had men always led isolated lives, any means of communication with one another would have been unnecessary, and language need never have been elaborated. Just as writing was invented for the wants of a civilised society, so we

may say that language was invented for the wants of an uncivilised society. The power of articulate speech was possessed by man, like the power of making laws, or of mathematical reasoning; but had it not been for social requirements it would have lain dormant, without a motive for calling it forth and using it as an instrument of intercommunication. In short, society implies language, race does not; and hence, while we may lay down that language is the test of social contact, we may lay down with equal precision that it is not a test of race.

This conclusion is borne out by a survey of the facts. The language we speak is not implanted in us at our birth. The child has painfully and slowly to learn his native tongue, though, doubtless, he inherits a certain aptitude for doing so. If he is born in England, it is English that he learns; if in France, French. If two or more languages are spoken by those about him, he is likely to acquire these languages more or less perfectly, according to the degree in which he comes into social contact with those who speak them. Languages, once well known, can be entirely forgotten, and foreign ones can become as familiar as though they were native. Children whose language was Hindustani have forgotten it utterly after a short residence in England, and it is often difficult to reproduce a sound which was constantly on the lips in childhood.

What holds good of the individual holds equally good of the community, which is composed of individuals. Here, also, the language spoken depends upon the influences surrounding the community. Whatever breaks up, amalgamates, or mixes the community, has the same effect upon the language it speaks. The community must be carefully distinguished from the race. The same race may be divided into a multitude of communities, each separate and independent, and with characteristics of its own. Indeed, except under the unifying pressure of a centralised civilisation, such independent communities *must* exist in every race, and the variety and unlikeness of the communities will be reproduced in the variety and unlikeness of their languages or dialects. The diversity of manners and customs will not be so great as the diversity of speech, since the speech is a reflection of the whole body of manners and customs, past and present, in each society. The infinitely numerous societies that have existed during the long period that man has been upon the earth, imply an equal number of forms of speech; and as these societies have been continually influencing one another, destroying, absorbing, modifying, and invigorating, the languages or dialects which they represent will have been in a corresponding state of flux. Indeed, the languages will have been affected even more than the societies themselves. A

society may continue to exist, thanks to its customs or the influences of race, while the language it spoke has disappeared, through the daily need of communication with other and more powerful societies. Thus Jewish societies exist all the world over, as separate societies with peculiar rites and customs, and apart from any question of race; and yet their language is, for the most part, that of the people among whom they are settled. The Jews of southern Austria are emigrants from Spain, and believe that old Spanish is their sacred tongue; and the Jews of Abyssinia, of China, and elsewhere, speak the dialect of the country in which they live. This is a strong case, as the disappearance of a language generally implies the disappearance of a community as a separate society. But it sets in a very clear light the fact that language is a test of social contact. Looking merely at the rites and customs of the Jewish communities, we should have no idea of the vicissitudes they have experienced, and the unallied societies which surrounded them. It is not until we come to the language that this is made plain; and so good a register of social influences is the language, that even without the aid of history we could have discovered the Spanish origin of the South Austrian Jews.

Now there are not many examples of so pure-blooded a race as the Jews, in the civilised world at any rate. Even among savages and barbarians, purity of descent is likely to be the exception, rather than the rule. Considering the antiquity of mankind, and the history of modern savage tribes, which are constantly at war with one another, or intermarrying into other clans, making wives of the slaves they capture, races as well as societies are probably somewhat mixed. In most cases, however, the type remains fixed and unmistakeable; but the mere possibility of mixture—that is, of close intercourse with another society—makes it impossible for language to be a criterion of race. We cannot tell whether the same event that has befallen the Jews has not befallen other races also, and that they have not been brought into such intimate connection with a foreign language (though, as with the Jews, not necessarily through the medium of marriage) as to have adopted it for their own. Keltic is extinct among the Kelts of Cornwall and the Isle of Man, and the same fate seems to threaten the other Keltic dialects of Great Britain and France. Slavonic has similarly disappeared from Prussia, and Basque alone is left of the pre-Keltic languages of Western Europe. Keltic itself had to make way for Latin in Gaul and Spain, like Punic in Africa; and the Normans first lost their mother tongue in Normandy, and then their new tongue in England. The Scandinavian colonies which existed in Greenland for 500 years left no traces behind

them, and Arabic in Sicily, and Visigothic in Spain, have been totally extirpated. The Melanesians and Papuans belong to different races and yet speak the same languages, and the same may be the case with the Finns and Lapps. A few inscriptions of doubtful meaning are all that is left of the Etruscan language. The race that spoke it was numerous and powerful; it was a language of literature and culture, and struggled successfully against Roman encroachment down to a late period; but the fragments of it that remain have been vainly compared with languages dead and living, possible and impossible, and I believe it to be the last waif and stray of an extinct family of speech. According to Humboldt and Bonpland, "a million of the Aborigines of America have exchanged their native for an European language." The inhabitants of S. Salvador, Nicaragua, Costa Rica, S. Margaretha, Baradéro, Quilmos, Calchaguy, and Chiloe, have exchanged their own idioms for Spanish, the inhabitants of Rio Janeiro for Portuguese. The negroes of Hayti have adopted French; while the soldiers sent by the Sultan Selim into lower Nubia in 1420 soon lost their mother-tongue. "Before the Christian era," as I have remarked in my "*Principles of Comparative Philology*," when dealing with this subject, "Hebrew, Assyrian, and Babylonian had been supplanted by Aramaic, which was fast tending to become the common dialect of the Semitic world, like Arabic in later times." The ancient agglutinative Accadian of Chaldea, in which a large and influential literature was written, and the first elements of Asiatic civilisation comprised, was so completely rooted out by the conquering Semites, that the very existence of the language was unknown till the last few years. And yet so important was it as to become the Latin of the educated Assyrian, whose science and art were locked up in this dead tongue, while members of the ancient race must have continued to exist in Babylonia after the extinction of their language.

These facts are more than sufficient to show that language is a test of social contact and not of race. But they do more than this. They show, on the one hand, that language is the best evidence of social contact we can have (as in the case of the Jews); but, on the other hand, that it does not prove a negative. Where there are traces of two or more languages in the same language, or where two distinct races have the same tongue, we can infer with absolute certainty that there has been social contact; but where such traces are not to be found, we are not justified in inferring that there has been no social contact. The instance of the Scandinavians in Greenland is a good warning. As regards race, language will tell us nothing. It does not even raise a presumption that the speakers of the same language are

all of the same origin. We have only to look at the great states of Europe, with their mingled races and common dialect, to discover this. Language shows only that they have all come under the same social influences. Race in philology, and race in physiology, mean very different things. When we find local names, which must be explained by another language than that at present existing in a country, we can only infer a difference of society, not of race. No doubt, identity of social relations may imply—and often does imply—identity of race; but to learn this we must go elsewhere than to language. Language tells us what the social relations have been; from these, other data and other sciences may enable us to argue to the race. In weighing the evidence, two points have to be borne in mind: one is, that civilisation tends to unity, combining and centralising diversified societies, languages, and customs; and the other is, that savage societies are in a constant state of flux. In an uncultivated age, therefore, we have to deal more with *dialects*, in a civilised age with *languages*. The first philologist who demonstrated the untenability of the assumption that language and race are correlative terms was the Rev. G. C. Geldart, in a Paper called "Language no test of Race," read before the British Association at Leeds in 1857. He treated the subject from the four points of (1) military, (2) religious, (3) intellectual, and (4) fashionable intercourse.

DISCUSSION.

Professor WHITNEY said, that he had little to do except to express his entire accordance with the author of the paper in all main points. There can be no real question that, as Mr. Sayce claims, language does not prove race. The truth of the matter may perhaps be best summed up in the statement, that the language which a man speaks is not determined by any peculiarity in his structure, physical or mental, but by his education; one's language is learned, not made by him. This is shown both by an abundance of special facts in the history of language (Mr. Sayce has quoted some of those currently used, while adding other interesting ones), and by a sound theory of language, as deduced from the totality of its history. The "linguistic faculty" with which men are gifted does not put any given language into their possession; it puts, rather, any and every language within their grasp. There is no dialect on the earth which any human being may not acquire, and use successfully for the satisfaction of the ordinary ends of speech; his peculiarities of race-endowment, as of individual endowment, may show themselves in the kind and degree of his mastery of the given dialect, but they do not guide him, or even point him, to the attainment of one dialect rather than another. The same "linguistic faculty" makes every man as capable of producing any given dialect

as have been some of those who have actually produced it. For every language is a historical product, wrought out in each race or continuous community by the gradual operation of the general human faculty or capacity of speech, working under the constant government of the special capacities and circumstances of that particular race or community. Every generation, in any community, receives, by a process of teaching and learning, what its predecessors have wrought out, and makes its own comparatively slight additions and modifications. A language thus goes down by tradition within certain geographical limits. It is virtually an institution, a part of the acquired culture of the people to whom it belongs; and, like every other part of culture, it is capable of transference. It may be abandoned by individuals of the race that produced it, or even by the whole race; it may be acquired by individuals, or even whole communities or races, which had nothing to do with its production. That, for example, a man of African ancestry learns a European tongue, is precisely parallel with his learning to make and use European houses and clothes—with his acquiring European habits, and opinions, and knowledge. It appears clearly from this how entirely a language is divorced from necessary connection with a race; and any estimate of the bearing of linguistics on ethnology which does not take due account of this nature of the relation between them, must lead to erroneous results. The testimony of language to race is simply that of an institution, inheritable, but also exchangeable. At the same time—as Mr. Sayce, in his paper, might well enough have more strongly insisted—there remains, in the actual condition of things in the world, an immense value to language, if not as the absolute proof, yet as the acceptable and trustworthy indication of race. And this from the simple fact that, after all, those from whom a human being learns to speak are usually his parents, and others related in blood with them. And this especially in regions and in periods where the evidence of language is most needed—among uncivilised races and in primitive times. Civilisation facilitates intermixture; and it is only civilisation and literary culture that give to any language the power to extend itself widely beyond its natural race-limits. Except under the government of the disturbing influences introduced by higher civilisation (and which leave, therefore, historic records to check and control the linguistic indications), language is the most clinging and persistent of institutions. What is of not less importance, it is by far the most surely traceable in its identity, and in its various changes and ramifications. The variety and definiteness of its facts are far beyond what is to be found anywhere else among the products either of men's minds or of their hands. The difficulty of the problem set before the ethnologist is immense, and he will be unable ever to solve it fully, even by the combination of all attainable evidences, from whatever quarter; but towards its partial solution, language, with all the drawbacks that cling to its application as evidence, will be found to have made the largest contribution.

MR. HYDE CLARKE said, that although the President had offered the opportunity of an immediate reply to what, he stated, was an attack on his (Mr. Clarke's) doctrines, he was glad that Professor Whitney had first spoken. The Professor had given a very clear exemplification of the true conditions of the problem, in the statement that language is a persistent institution, and that it is a valuable indicator of race. Mr. Clarke also concurred with him in esteem for anything coming from the pen of Mr. Sayce, as it certainly is true that language is an indication of association. In stating this part of his case, Mr. Sayce, however, had not exhibited his usual care, nor grasped the whole subject. The gipsies spoke their own language as well as that of the country in which they lived, and thereby afforded evidence of its Aryan character, and of their previous migration. The Jews, in the same way, though not to the same extent, colloquially preserved sufficient of their language to indicate its Semitic character. It was, however, scarcely safe to speak of the Jews as a "pure-blooded race." No one could look at the Jews, or read the testimony of the Bible, without feeling that the Jews are a mixed race. The recent paper of M. Clermont Ganneau on the inhabitants of Canaan, lately read before the Palestine Exploration Society, in *Macmillan's Magazine* for August, gave useful matter on this head. Anyone could see, that while there were Jews of the highest type of beauty, there were others of decidedly negroid characteristics. The study of language in connection with anthropological features may therefore help us in this case, as in many others, where we have mixed races to deal with, and not, as Mr. Sayce has here assumed, one of pure blood. That, in fact, is one element of the value of language, that as so many races are mixed, language may give us one or more indications of the components to be used in conjunction with the other branches of anthropological evidence. While many of Mr. Sayce's facts in relation to what, for the purpose, may be called the historic conditions, are correct, his statement that the languages of savages are in a constant state of flux is not borne out by facts, and is contradicted by observations on a large scale which cannot be got over. There are, undoubtedly, causes of variation and mutation in operation, and notably taboo, which has just been exemplified on the death of the Emperor of China; but the fact of the persistence of language remains. As to the circumstance that neighbouring tribes cannot communicate, it has no necessary connection with the subject. In any centre of refuge or migration—in the Caucasus, Central India, West Africa, the Rocky Mountains, the Amazonis—as the representatives of distinct races and languages are brought into neighbourhood, it necessarily follows that their languages are not identical. Again, he begged to call Mr. Sayce's attention to facts, which he could test by the accessible evidence. The short races of North America spoke languages which generally differed from those of the tall races, but these languages of the short races conformed to those of short races elsewhere. There was the extensive parallelism between the aboriginal languages of India and those of

West Africa. It was open to the commonest observation that there were relationships between distant languages, beyond coincidences and beyond the result of commercial or political intercourse. These consequently represented a long efflux of time since the original separation, and thus showed identity of words during hundreds or thousands of years. Nothing but total neglect of the common means of observation could leave anyone in ignorance of the facts relating to prehistoric culture. Mr. Sayce appeared to have regarded simply what may be termed the historic conditions, when the functions of language are different from what they are under prehistoric or savage conditions. The highly organised language of a great empire is a most powerful instrument of culture, and is well calculated to supersede the dialects, which have less power. It is fortunate that so it is, because our own language, among others, has thus become a potent means for the civilisation of barbarians. The social relations of language—and, indeed, the relations of society among rude tribes—are, therefore, by no means such as are described by Mr. Sayce. We have, indeed, much to learn as to the early development of language. Even gesture-language required a more copious examination than Mr. Sayce had given to it. Then, new facts on new subjects were ever opening to them. They were as yet but little acquainted with the forms of male and female languages; while Mr. Menzies had lately, at the Philological Society, brought forward examples of children's language in England, and Mr. Rogers, the orientalist, had promised this Institute a paper on a children's language in Syria. On a continued review he (Mr. Clarke) believed that language was a most useful indicator of race under due conditions, and he concurred with Professor Whitney, while he believed that Mr. Sayce would adopt the like conclusions, when he applied to the earlier epochs the same great powers which had enabled him to do so much for the later and classic periods of language.

Mr. BOUVERIE PUSEY remarked, that to hear such valuable and admirable truths put so effectively, and by two eminent philologists, seemed to him like the dawn of anthropology after a long night. He hoped in future to hear no eminent philologist assert "that the dark-skinned inhabitants of India and the fair people of Northern Europe are descended from one stock"; nor any anthropologist gravely inquire what is the Keltic form of head, or the Aryan type of hair. We might as well talk of a Mahomedan skull or Christian hair. Language is an element of culture, like religion or government. Anthropology should go on its own way, and have its own nomenclature, *e.g.* *Homo sapiens* var. *brachycephalus*, &c. Professor Whitney, whom we are proud and honoured to hear speak at this meeting, has not quite remembered some of the facts of savage life. However much we boast of railways and steamships as means of migration, it is probable that savages (with few wants, and nomadic or semi-nomadic habits) find it easier. Professor Whitney seems to think civilised nations are likely to be mixed, because they are comparatively at peace, and savages likely to be unmixed, because

always at war, forgetting that savage war is one of the chief means of admixture, through bringing in captive women as concubines and captive men as slaves, who are afterwards incorporated. Most barbarous tribes are small clans, frequently in motion, and surrounded by a following of foreign or mixed race, which gradually become incorporated in the nucleus. The language of such a community will be that of the dominant or relatively civilised portion, rather than that of the numerical majority. It is in the middle period, between barbarism and civilisation, that migration is most difficult. Language is a test of social contact rather than of race; but social contact generally implies blood admixture.

Mr. HOWORTH, Señor de la ROSA, Major OWEN, and the PRESIDENT also spoke on the paper.

Mr. FRANKS exhibited a gorget from Easter Island.

Professor WHITNEY presented a series of seventeen photographs of Antiquities of Colorado, and made the following remarks: The photographs presented were a gift from Dr. F. V. Hayden, chief of the United States Survey of the Territories, having been taken last summer by the photographic party of the survey. They were seventeen in number, and represented certain remains of a prehistoric aboriginal civilisation in Colorado—remains which had never been visited before by men of science, though rumours of their existence had been heard, and search had more than once been made for them. In the absence of any published account of them hitherto, Professor Whitney said a few words in explanation of their somewhat peculiar character. They occurred through a tract of several miles in the valley of the Maneos, a tributary of the Colorado, in the extreme S.W. corner of the Colorado territory. The broad alluvial valley is, as usual, lined with high precipitous sides, two or three miles apart. It had evidently been cultivated, with help of irrigation, by a settled and agricultural race. These, however, had been driven, by the attacks of wilder tribes, to fortify themselves in and along the valley, and were finally driven out or exterminated. The photographs showed a ruined town in the plain, a mile in circumference, with walls of stone, twenty feet thick at the foundation. There are also isolated towers or forts, built usually on the crest of rocks; or walls on the precipitous fronts, enclosing broad niches behind; or regularly laid stone dwellings nestled in crevices, sometimes almost inaccessible, even without resistance on the part of the occupants. The material used was the stone of the region, which breaks up easily into layers. It had been rudely squared and shaped with stone implements; it was sometimes laid in a kind of mortar. Owing to lack of time,

the party made no extended excavations, and no pottery or other remains were found. It is intended to revisit the locality this year more at leisure.

A special vote of thanks was unanimously passed to Dr. Hayden for his gift, and to Professor Whitney for his attendance. The meeting then separated.

MAY 25TH, 1875.

Colonel A. LANE FOX, *President, in the Chair.*

The minutes of the previous meeting were read and confirmed.

Elections were announced of E. R. MUSPRATT, Esq., F.C.S., Suffolk Hall, Seaforth, Liverpool; EDWARD CROFT GREENWAY THOMAS, Esq., Civil and Sessions Judge of Vizagapatam, India; THOMAS COLLINSON, Esq., of the Elm, Southey, Sheffield.

The list of presents was read as follows, and the thanks of the meeting were voted to the respective donors:—

FOR THE LIBRARY.

- From the EDITOR.—*Materiaux pour l'histoire primitive et naturelle de l'homme.* Vol. VI. Nos. 4 and 5, 1875.
- From the BERLIN ANTHROPOLOGICAL SOCIETY.—*Zeitschrift für Ethnologie.* No. 6, 1874.
- From Messrs. LONGMANS and Co.—*Native Races of the Pacific States of North America.* Vol. II. By H. H. Bancroft.
- From Dr. JOHN SHORTT.—*Cyclopædia of India.* 2 Vols. By Edward Balfour.
- From the SOCIETY.—*Proceedings of the Royal Society of Tasmania,* 1873.
- From the Rev. T. FELTON FALKNER.—*Proceedings of the Royal Asiatic Society (Ceylon Branch).* 1873 and 1874.
- From Prof. A. ECKER.—*Archiv für Anthropologie,* Band 8, No. 4.
- From the SECRETARY OF STATE FOR INDIA IN COUNCIL.—*Census of the Bombay Presidency.* Parts 1 and 2, 1872. Ditto, *Madras Presidency.* Vols. I. and II. 1871. By W. R. Cornish, F.R.C.S.
- From the AUTHOR.—*Inaugural Address of the Psychological Society of Great Britain and Ireland, April 14, 1875.* By Mr. Serjeant Cox.
- From the SOCIETY.—*Journal of the Royal Geographical Society.* Vol. XLIV.
- From the EDITOR.—*Revue Scientifique.* Nos. 46 and 47, 1875.
- From the AUTHOR.—*Sulla radice bifida dei canani inferiori nell'uomo; Della capacità delle fosse nasali; Dei caratteri gerarchici del cranio umano; Il ritratto di due chiriguani.* By Prof. P. Mantegazza.

From the SOCIETY.—Proceedings of the Royal Society. Vol. XXIII. No. 161.

From the AUTHOR.—Principles of Mythonomy. By Luke Burke.

From the EDITOR.—Nature (to date.)

FOR THE MUSEUM.

From J. MILLIGAN, Esq.—Tasmanian Necklace.

From Dr. JOHN SHORTT.—Skeleton of Male Hindu (Soudra).

The following papers were read by their authors:—

A FURTHER ACCOUNT of the BEOTHUCS of NEWFOUNDLAND.

By T. G. B. LLOYD, C.E., F.G.S., M.A.I. [With Plate vii.]

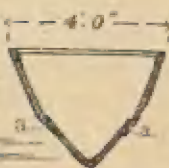
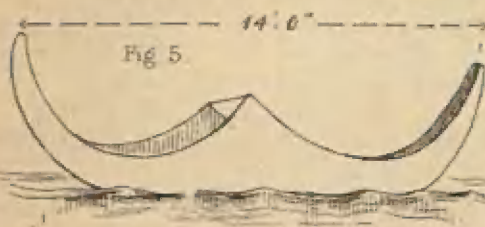
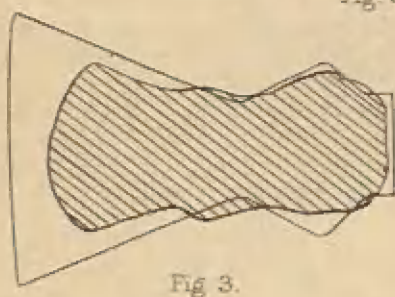
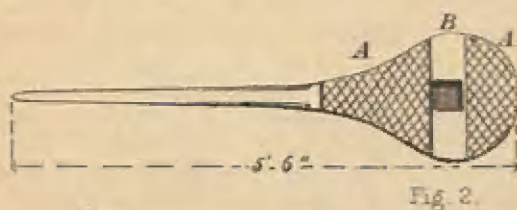
THE following account of the Aborigines of Newfoundland is a continuation of the subject of a paper I had the honour of laying before the Institute last year.*

The second paper contains a description of a number of stone implements which I discovered during a cruise round the island last summer, and inferences as to the probability that the Beothucs were the fabricators of them, and of the origin and probable destiny of that people. In an extract from the voyages of Cabot, given at the commencement of my former paper, mention is made of savages having been seen on St. John's Island. It appears to be a matter of doubt whether the Island of Newfoundland is there referred to, or whether Prince Edward Island, which was for a long time known as the "Isle of St. John," may not have been the one to which Cabot alludes.†

Old Camping Grounds; Bonavista Bay.—On the north-west shore of "Bloody Bay Run," at the north side of the entrance to Rocky Bay, in Bonavista Bay, a narrow, gravelly beach connects an outlying mass of rock on the east with the mainland. It is about a quarter of a mile long, and of an average width of about 120 yards, being narrowest in the middle, and widening out on the east and west. Its flat surface, which rises about 5 or 6 feet above sea level, is partially covered with long grass, the centre portion being bare of vegetation. On the western side of the bar are two rows of circular pits, numbering thirteen in one and three in the other. At the eastern end a row of three pits was visible, which corresponded in direction with the longer row at the western end. They averaged about 12 feet in diameter, and were placed at distances from each other varying from 3 feet to 24 feet. Their depths also differed: some of them were about 2 feet in depth, whilst others did not exceed 6 or 7 inches. All the pits were flat at the bottom. The relics of their former occupants comprised a piece of round iron, about 4 inches

* See "Journ. Anthropol. Inst.," vol. iv. p. 21.

† See the "Maritime Monthly," vol. iv. p. 291-92.



long, flattened at one end, and very much rusted; some stones, bearing marks of fire upon them; a few bones; and a small heap of single valves of shells of *Mya arenaria* and clams. It will be observed that the locality selected by the Beothucs is well adapted for a fishing station, besides commanding an uninterrupted view across the sea to the north and south.

Mouth of Victoria Brook; Red Indian Pond.—Victoria Brook, the principal tributary of the Exploits river, enters the south side of Red Indian Pond through three outlets. On a low sandy point, projecting from the eastern side of the chief outlet into the pond, were the remains of a small encampment; in a small clearing amongst the alder bushes, three circular wigwam pits were arranged in a straight line, near the water's edge. One of them was 15 feet in diameter, and the other two measured 10 feet 6 inches across the middle. They were placed about 7 feet apart. Numerous small fragments of bones were found in the centre of the larger one. The remains of a circular trench were visible around its edge.

The camping ground stands on the line along which the Caribou deer are accustomed to cross Red Indian Pond during their periodical migrations. Judging from the small size of the encampment, and its situation, it was probably used only at such times.

Red Point.—Eastern Arm of Red Indian Pond.—Near the edge of a steep bank of drift overlooking the water, and about thirty feet above it, was a group of wigwam pits, twenty-one in number. At a short distance to the east was another series of pits, which extended as far as Low Point, where the Micmac wigwam is built. The largest pit of the group commanded an uninterrupted view across the arm of the pond. It was in all probability so placed for observing the movements of the deer when crossing over to the point below. A circular excavation had on one side a raised bank of earth, about four feet high above the bottom of the trench inside. The top of the bank slopes gradually down to Low Point, where it is not more than three or four feet above the pond. The largest pit I have seen measured thirty-three feet in diameter. The Micmac trapper of the district gave me the following description of the wigwam, which was formerly erected over it. (Plate VII. fig. 4.) He received the account from his father, who hunted over the same grounds about forty years ago.* It was built with

* Bancroft, in his interesting volume on the "Native Races of the Pacific States of North America," in describing the various devices used by the Columbians for capturing game, says the frightened deer are driven into an ambush by converging lines of bright-coloured rags, so placed in the bushes as to represent men—p. 264.

eight sides, at the corners of which upright posts were driven to carry a bow frame for supporting the sides of the wigwam. The entrance is shown at B. Inside one of the pits a few strips of decayed birch bark and fragments of charcoal were found, and in and around others a considerable number of the broken shafts, and articular ends of marrow-bones of deer, besides some astragali, lay under the turf. Almost all the marrow-bones were broken off short at the ends, but one was found which had been split open lengthwise, in the manner usual amongst the Micmac hunters. These people have been accustomed to camp on the spot for the last forty years. It is, therefore, not surprising that the refuse-heaps of the original and present occupiers of the place should be found mingled together.*

About three miles to the north of the eastern arm there is a deer fence, running in a direction north and south, across a wide marsh. It has been reconstructed by the Micmac Indians, partly out of the old materials left by the Beothucs, who formerly built one on the same site. The stakes, which are, for the most part, those planted by the Beothucs, have been re-stuck in the ground in a zigzag manner, and on their tops, which now stand about three or four feet above the surface, were placed sods of grass, to serve the same purpose as the "sewels" described in my former paper. This fence formerly extended as far as the south-east side of Grand Pond, a distance of about thirty-five miles, as marked on one of the maps of North Island. There are also remains of another fence on the north-east of the same pond.

The other localities where remains of old encampments still exist in the district of the river Exploits are as follow:—Right bank of Exploits river, about three or four miles north-east of the mouth of Noel Paul's Brook; junction of Badger Brook with a stream running from Little Red Indian Pond; Rushy Pond, on left bank of Exploits river. Besides these there are a few between Grand Pond and Hall's Bay on the Indian Brook.

Mr. Alex. Murray, of St. John's, told me he had found, about four or five years ago, remains of poles and birch bark coverings of wigwams at Badger Brook.

Canoes (Pl. VII. figs. 5, 6).—In a foot-note in my former paper (p. 27) I expressed a fear that the shutting-up of the canoe, as described by Mr. John Peyton, would have caused the joint (fig. 6, *a, a*) at the keel of the canoe to open and let in the water. During a short interview with Mr. Peyton in November last, he gave me to understand that the joint in question was made of a kind of plaster, by which, his

* It is customary among the Micmac Indians to divide the hunting grounds into separate districts, which descend from father to son.

son told me, he referred to a strip of deerskin, which was fastened to the lower edges of the birch bark, thus forming a flexible hinge, by which means the canoe could be folded up without injury. Mr. Thomas Peyton, who said he once found the remains of a canoe, described the side of it as consisting of two sheets of bark, the edges of which formed a joint half-way between the keel and the gunwale.*

The *Arrow*, of which Cartwright gives a description (see former paper, p. 28) was fitted with an ornamentally carved horn, fastened to the shaft by iron pins. Mr. Peyton told me he had one in his possession, but was unable to find it during my visit.

The *Harpoon* which the Beothucs used for killing seals differed only in the shape of the head from those made use of by the Eskimo of the north-east coast of Labrador. Fig. 1, pl. VII. is a copy of the sketch which was drawn for me by Mr. John Peyton. The wooden shaft, A, is inserted in a socket in the barbed piece of bone, B, in which are *two* holes for the attachment of cords. Into the extremity of B an iron point of a lozenge shape, C, was driven. The object of the second hole is not apparent.

Snow-shoes (Pl. VII. fig. 2).—The snow-shoes were of a somewhat different shape and construction from the ordinary North American type, resembling the racket of our English game, inasmuch as they were broader in the nose, and far longer and more taper in the tail, which caused the ends to bend upwards under the weight of the body. A board, with a hole in it to receive the toes, B, was fixed across the middle of the "racket" bow, A A. The matting was composed of "seal skin or of cord" (or more probably, I should think, of babiche made of deer or seal skin).

During my first visit to Mr. John Peyton, in reply to the question, "How did the Beothucs obtain fire?" he replied, that they ignited the down of the blue jay† by sparks struck from two pieces of iron pyrites. This statement I omitted in my former paper, on account of its apparent improbability; but one evening during my stay last fall in the wigwam of the Micmac hunter Johnny Joe, my guide, Reuben Soulianne, remarked that the Red Indians were witches, for they could raise a fog through which to escape; to which credible statement, when pursued, Johnny Joe added, "Yes, and could kindle a fire from the down

* At the present time it is difficult to get birch bark in North Island of a sufficiently good quality for making canoes. There is only one locality known where such can be procured, and I have been told that an old Indian named Noel Paul is the only man left who is capable of making them.

† The bird spoken of is not the blue jay, but the Canadian jay (*Corvus canadensis*), which is a constant attendant at meal-time in the bush. It is ordinarily called the blue jay by the Newfoundlanders.

of a blue jay and pieces of mundic, or flint and steel." Subsequently I mentioned the subject to a seafaring man, whom I met at Jil's Cave, who told me he had seen the feathers of the blue jay take fire and blaze up like paper. On repeating to Thomas Peyton what his father had said, he told me it was quite a mistake. I regret I did not put the question to his father; but from the circumstance that he now, at the age of eighty, had become very deaf and failing in memory, I found it very embarrassing to obtain even the few details I got from him during an evening's visit.

The *iron axe*, which I obtained from Johnny Joe, who said he found it at the bottom of Red Indian Pond, was recognised by Mr. J. Peyton as one of those which had been stolen by the Beothucs from the white settlers. It was originally of the shape shown by the outline in the sketch (Pl. VII. fig. 3), and must have been a clumsy tool, such as the British woodman uses at the present day.

The Indians had, it seems, cut away the wings, so as to form an implement, as far as was possible, like a tomahawk, as shown by the shaded part of the figure.* The groove on each side shows where the process of conversion was discontinued. Some such tool as a cold chisel must, I imagine, have been used in the operation.

An *iron arrow-head*, with the mark of the broad arrow upon it, was found near the mouth of Badger Brook. It is one of a number made for Lieutenant Buchan, who, with Mr. Peyton, conveyed them to the places frequented by the Beothucs, and tied them up in bundles to the branches of the trees for their use. According to Mr. Peyton, they were far inferior in workmanship to those manufactured by the Indians.

Mr. James Howley, of St. John's, has given me some information obtained from Mr. Peyton some time ago, which is as follows:—The Beothucs were a much finer and handsomer race than the Micmacs, having more regular features and aquiline noses; nor were they so dark in the skin. They were of middle stature, and of a very active build. They did not appear to be so fond of gaudy colours as their continental neighbours. They constructed a wall of stones, clay, and sods on the outside of the trenches of their wigwam pits.

Further information regarding the Red Indian, in the Museum at St. John's, Newfoundland.—Mr. Alexander Murray, in answer to my queries, says, in a letter, dated March 19th, 1875: "I have made a discovery regarding the Red Indian skull I have. It appears that Dr. Winter, of this place,

* The shape of the American axe of the present day appears to have been copied from the stone implement of the country,

took it and a thigh bone from the skeleton which was found on the straight shore opposite the Indian Islands, in Sir Charles Hamilton's Sound. The skeleton, according to Dr. Winter, had been wrapped in birch bark, and buried in a sitting posture, and had various stone implements entombed, together with large crystals of iron pyrites to strike fire with when he woke up again. Dr. Winter further states, that the remains bore evidences of having been shot, some large seal- or swan-shot being found sticking in the bones, some of which and the skull were fractured."

They had a very ingenious mode of preserving their venison in a fresh state; they first of all cut it into thin strips, and after having taken out the veins and sinews, and washed away the blood, they packed it in alternate layers of meat and melted tallow, in a casing of birch bark, which they bound up tightly, thus forming an hermetically-sealed mass. On one occasion when Mr. Peyton was on an excursion up the river Exploit, he surprised a party of Indians at dinner; they took to the woods on seeing him, leaving everything behind. A tin kettle, stolen from the fishermen, was hanging over the fire, in which venison was boiling. It is a curious circumstance that the Indians, on seeing a gun in the hands of a white man, would instantly fly for their lives; but as soon as it was discharged, they would return and take it in their hands, and examine it with the greatest curiosity. If this be true, it would indicate that they must have been, at one time, on familiar terms with the white population. (See former paper, p. 22).

The skull of a woman which I saw in the Museum of the Geological Survey, at St. John's, Newfoundland, at the time of my visit in the year 1873, had a label attached to it, "Skull of Red Indian." My inquiries at the time as to its true history were not satisfactory; I therefore hesitated to affirm its authenticity. However, on my return to Newfoundland last year, I made further inquiries respecting it, with the following result:—The Indian woman, Shawnadithit, mentioned in the former paper, who was at the time living in Mr. Peyton's house, procured the skull for the explorer Cormack, to whom she presented it, together with a lock of her hair and other small articles. The whole of these were given by Cormack to the Beothuc Society of St. John's, and, subsequently, were transferred to the Athenæum there, from whence they were finally removed, together with some stone pots, axes, and arrow-heads, to the Museum of the Geological Survey under Mr. Murray's care.

Mr. Peyton's answers to some miscellaneous queries re-

specting the Beothucs.—The Newfoundland dogs were savage towards the Indians, and whenever Mary March touched one of them, it would show signs of anger.

The Indians worshipped the sun if they worshipped anything; but it is not known whether they had any religion. They had single wives, and the women were chaste. They left the hair on the skins, which they used for clothing, clipping it short, and wearing the hairy side next the skin. They dressed the skins soft and supple.

Old Paul, the Micmac trapper of Exploits river, told me he believed the last of the Red Indians perished from starvation during the winter time, after having been driven away northwards. There is a tradition that the remnant of them, after climbing to the summit of "Indian" Hill (Half-way Mountain of the maps), took a track northwards, and were never seen again.

The most important evidence regarding the ultimate fate of the "Last of the Beothucs," is that given me by Mr. Murray. He was told by Mrs. Peyton, that according to a statement made to her by Shawnadithit, the Indian woman who lived with her, only fourteen individuals of her tribe were then living (about the year 1825).

An anecdote of Mary March, related to me by Mr. John Peyton, may serve to illustrate in a measure her natural disposition. After her capture, she refused to take any food from anyone except himself, and used to sleep in the tent by his side. One night she was missing from her accustomed place. At dawn of day a search for her was made. She was at last discovered crouching in the snow about two or three hundred yards from the tent. It appeared that, having taken off her deerskin dress, and laid it under her on the snow, she had dragged herself along on her hands and knees, without leaving any mark of her track behind her, except that made by the dragging of the skin. On finding she was discovered, she bared her breasts, thus disclosing her sex, of which Mr. Peyton was unaware, as the men and women dressed alike. She soon became attached to him, and would place his snow-shoes under her pillow on retiring to rest, for fear he should leave her behind.

Cooking Utensils.—In my former paper (at p. 22) an account is given of the vessels of birch bark which were found by some English sailors in an encampment of the Beothuc Indians whilst a feast was going on. Now, it is doubtful whether the pots were hung over the fire, or whether the water therein was boiled by throwing in hot stones. Cormack, in his account of an expedition across Newfoundland, says, in reference to the

remains found in an Indian village:—"There was also discovered the remains of a vapour bath. The method of raising the steam was by pouring water on large stones, made very hot by a pile of fuel around them. After the ashes were cleared away, a framework closely covered with skins, to exclude the external air, was fixed over the stones. The patient then crept in under the skins, taking with him a birch-bark bucket of water and a small bark dish, by which he poured the water on the heated stones." The "three stems" which supported them may have been three sticks, bound together at their upper ends, from which the kettle was suspended.* It appears that the Beothucs did not make any kind of pottery; but, according to Mr. Peyton, they manufactured vessels of soap-stone, a circumstance to which I shall refer again in my description of the stone implements.

The Vocabulary.—At p. 37 of my former paper will be found a vocabulary of the language of the Beothuc Indians. In order to get a start on the right trail, I wrote a letter to Dr. R. G. Latham, enclosing a copy of my paper, in answer to which I received a reply, from which the following is an extract:

"The Beothucs were 'Algonkin,' as opposed to 'Eskimo,' and as Algonkins they were not a mere branch of the Micmacs, Scoffies, and the like, of the main continent. They were members of a division of their own—not a very distant one, but still a separate one.

"Upon my inspection of your vocabulary, I venture, *meo periculo*, on the following conjectures, though I, of course, look upon them as certainties:—

"'Good night.' This is the word in which the ethnological name originated. It was the word caught up by the earlier discoverers, *i.e.* the Beothuc Indians—the 'Good-night Indians.' This is a recognised process of developing names. The root 'kuis' = 'sun,' and 'moon'; *kuis* = light. Under 'moon,' 'kuis [and] washewnish'—light of night; being a compound, and *not* two synonymous words. (See 'night.') The same is doubtless the case with 'sun'—light of day, though, as we have no word for day, we cannot prove it. Most of the Algonkin languages illustrate this."

EXPLANATION OF PLATE VII.

Fig. 1.—Harpoon-head used by Beothucs (from Mr. Peyton's sketch). A, wooden shaft; B, barbed piece of bone; C, triangular head of iron.

* I have been told by the Micmac Indians that water can be boiled in such vessels over a fire, if done in a gradual manner.

Fig. 2.—Snow-shoe, used by Beothucs. A A, netting of cord or sealskin; B, board, with foot-hole.

Fig. 3.—Axe found in Red Indian Pond, Newfoundland. The outline shows probable original shape of axe, whilst the shaded part of the figure represents its form as converted into a tomahawk by the Beothucs.

Fig. 4.—Section through centre of a Beothuc wigwam. B, the entrance.

Fig. 5.—Red Indian Canoe of Newfoundland.

Fig. 6.—Sketch-section of canoe amidships.

DISCUSSION.

MR. E. B. TYLOR inquired whether any exact description has been preserved of the complexion of the Beothucs. The presence of fair tribes on the north-west coast of America, described as not darker than Spaniards, and as sometimes with blue eyes, had given rise to ethnological speculations as to immigration of tribes from Asia, &c. The similar phenomenon of fair tribes appearing in Newfoundland seems to throw light on this problem, but the mere assertion that their complexion was fair is too vague to found an argument upon.

MR. LLOYD, in reply to the query respecting the complexions of the Beothuc Indians, said that, in the opinion of Mr. John Peyton, who is the only man now living who was familiar with their personal appearance and with their complexions, they resembled gipsies or Spaniards.

DESCRIPTION of two BEOTHUC SKULLS. By GEO. BUSK, F.R.S., V.P. Anth. Inst. [With Plate viii.]

MR. LLOYD, on his late visit to Newfoundland, was unable to obtain any skull belonging to the aboriginal Indian inhabitants, although he was afforded an opportunity of inspecting several, and had a photographic view of one taken. Owing to the circumstance, however, that this view had been taken from the skull in an oblique position, and was without any scale of measurement, it was not available for the determination of the craniological characters.

But as he was desirous of supplementing his remarks upon the "Beothucs of Newfoundland" by some account of their cranial peculiarities, I have, at his instance, been very liberally allowed the opportunity of examining and figuring two authentic specimens of the skull of that people, which are now in the Edinburgh Museum, having, I believe, been presented to the late Professor Jamieson, by Mr. M'Cormack, in 1826.

Fig 1.

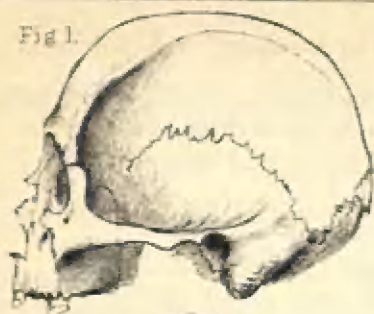


Fig 2.



Fig 4.



Fig 3.



Fig 5.



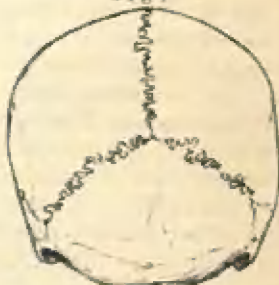
Fig 6.



Fig 8.



Fig 7.



I.—One of these skulls (Pl. viii. figs. 1—4.) is that of a "male Red Indian from Newfoundland."

It is the skull of an elderly man, and has the lower jaw attached. Its principal characters are as under:—

1. *Norma lateralis*.—Forehead high and arched; the outline slopes with a gentle curve from the vertex to the apex of the occipital. Occiput prominent; spine very strongly developed. Subinial portion much hollowed and horizontal, mastoid processes very large and thick; but the digastric fossa of moderate size. Zygomata thin.

2. *Norma facialis*.—Forehead narrow, but rounded. Frontal sinuses well marked. Supraorbital border towards external angular process rather thick, and that process is prominent. Supraorbital foramen complete. Orbits quadrangular (1.5×1.5). Nasals broken off; what remains of them shows that they were strongly carinate and continuous with the forehead. Nasal spine very prominent. Face orthognathic.

3. *Norma occipitalis*.—Outline subpentagonal, the sides sloping inwards from the mastoid region. The temporal lines are seen approaching within two inches of each other, at about the level of the summit of the occipital. They extend far further back than is usual.

4. *Norma verticalis*.—Outline broadly oval. Zygomata just visible (subphænozygous).

Norma basalis.—Palate deep, elliptical. *Foramen magnum* (1.5×1.3), horizontal.

This skull is chiefly remarkable for the elevation of the frontal region seen in profile, and the comparatively sparing elevation of the parietal region, which, however, cannot in this case be assigned to an early closure of the sagittal suture. As in the female skull, the occiput is projecting. In fact, the outline of the two skulls, starting from the vertex backwards, is very nearly alike in the two. The chief difference between them is the more upright forehead in the female skull. In both there is no depression at the root of the nose, and in both the nasal spine is very prominent. In both, also, the greatest width is in the squamosal above the auditory foramen.

II.—The other skull (Pl. viii. figs. 5—8) is entitled that of "a female Red Indian of Newfoundland," who died, or was killed, in the year 1823. It exhibits the following characters:—

5. *Norma lateralis*.—Forehead upright, but rather low, continuous with the nasals, of which bones only a small portion remains. The outline is moderately arched in the vertical region; the occiput projecting, much hollowed in the subinial portion, and bulging on either side below the superior semicircular lines. The maxilla is slightly prognathous.

6. *Norma facialis*.—Forehead narrow; supraorbital borders thin; frontal sinuses very faintly marked; supraorbital foramen complete. Orbits subcircular, large (1.5×1.5). Nasal spine prominent. Nasal opening triangular.

7. *Norma occipitalis*.—In this view the outline is pentagonal, sloping on either side rather rapidly, from the sagittal suture (subfastigate), and flattened on the sides.

8. *Norma verticalis*.—Outline broadly oval; zygomata invisible (aphænozygous).

Norma basalis.—Three sound but worn molars remain on the left side; all the other teeth are gone, but the alveoli are perfect. Palate deep and narrow. Pterygoid plates remarkably narrow. Foramen magnum circular, horizontal.

The sutures are all open, and finely serrated; the spheno-parietal measure $\frac{3}{4}$ of an inch. Remarkably deep grooves for the anterior branches of the temporal artery. The zygomata slender. The mastoid process well developed; the digastric fossa deep and wide.

On comparing the photographic figures procured by Mr. Lloyd, a close resemblance in most respects may be traced between the skull of the female above described and Mr. Lloyd's figures. Amongst the points of resemblance I may notice the upright frontal outline continuous with the nasals—the absence of indications of the frontal sinuses and the slight maxillary prognathism. In the occiput also the same degree of projection may be perceived, although, from the oblique position of the photographic figure, this character is somewhat concealed. The orbits, however, in the photograph are more angular than in the skull.

It may be remarked that neither of these skulls presents the least sign of artificial deformation.

The dimensions and capacity of these two *Beothuc* skulls are given in the subjoined table:—

| | No. 1. | No. 2. |
|-------------------------------|--------|--------|
| Length | 6.7 | 7.1 |
| Breadth | 5.5 | 5.8 |
| Height | 5.6 | 5.8 |
| Least frontal width | 3.9 | 4.1 |
| Coronal width | 4.7 | 4.7 |
| Parietal width | 5.3 | 5.4 |
| Occipital width | 4.4 | 4.6 |
| Zygomatic width | 5.2 | 5.9 |
| Frontal radius | 4.6 | 4.9 |
| Vertical radius | 4.7 | 4.9 |
| Parietal radius | 4.8 | 4.75 |
| Occipital radius | 3.9 | 3.75 |

| | No. 1. | No. 2. |
|--------------------------------------|--------|--------|
| Maxillary radius | 4·0 | 4·3 |
| Fronto-nasal | 3·7 | 4·0 |
| Circumference | 19·4 | 20·5 |
| Longitudinal arc | 14·0 | 14·5 |
| Frontal longitudinal arc | 4·7 | 5·1 |
| Parietal longitudinal arc | 5·0 | 5·2 |
| Occipital longitudinal arc | 4·3 | 4·2 |
| Occipital (subinial) | 1·8 | 2·4 |
| Frontal transverse arc | 11·8 | 12·7 |
| Vertical transverse arc | 12·8 | 13·1 |
| Parietal transverse arc | 13·2 | 12·8 |
| Occipital transverse arc | 10·8 | 11·0 |
| Latitudinal index | ·820 | ·816 |
| Altitudinal index | ·830 | ·816 |
| Gnathic index | ·500 | ·325 |
| Capacity C.I. | 84 | 92 |

EXPLANATION OF PLATE VIII.

Figs. 1 to 4. Skull of a male Red Indian of Newfoundland.—Fig. 1, norma lateralis; 2, norma facialis; 3, norma occipitalis; 4, norma verticalis.

Figs. 5 to 8. Skull of a female Red Indian of Newfoundland.—Fig. 5, norma lateralis; 6, norma facialis; 7, norma occipitalis; 8, norma verticalis.

On the Stone Implements of NEWFOUNDLAND. By T. G. B. LLOYD, C.E., F.G.S., M.A.I. [With Plates ix. x. xi.]

THESE implements belong to the class known as surface implements. Numerous discoveries of chisels, gouge-shaped implements, stone pots, spear-heads, &c., have been made in various parts of the island, a few of which have found their way into the Museum of the Geological Survey at St. Johns. Some have been carried away out of the country as "curios," whilst others have been preserved for use as hones by their discoverers. The localities at present known are comprised in the following list. Starting from St. Johns, from east to west, and passing round the island, they will be met with in the following order:—Fox Island, Randra Sound; Trinity Bay; Bonavista Bay; Funk Island; Torilinguet Island; Nôtre Dame Bay (Bay of Exploits and Hare's Bay); Granby Island, Sop Island, White Bay; Conche Harbour; How Harbour, Hare Bay; Bonne Bay; mouth of Flat Bay Brook, St. George's Bay; Codray River. It is probable that the foregoing list does not include many of the localities where stone implements have

been found, because such relics are generally regarded as of little value, and no record is kept of their discovery.

It is worthy of remark that the localities in the foregoing list are situated on or near the sea coast.

The stone implements which had been brought to notice previous to my visit in 1873, were, as far as I could learn, of the larger sorts, viz. stone pots, gouges, and spear-heads, with the exception of a few "sinkers" dug up at the Indian Burial Ground in Nôtre Dame Bay, until my discovery of stone relics of different classes at Sop Island and Conche Harbour.

Sop Island.—At the back of a small cove near the northern end of the island is a small piece of ground which had been converted into a potato patch by an Indian family then living on the island. In the blackish vegetable soil of which it is composed, and at a depth of a few inches below the turf, a considerable number of stone implements were discovered, such as chisels and pieces of broken pots; some of them had been found, previous to my visit, by the Indian people, and removed to their dwellings. On visiting the spot, I picked up, after a short search amongst the potatoes, two or three finely worked arrow-heads. Whilst I was thus occupied, my Indian guide set to work to remove the turf from the sloping bank between the potato ground and the sea-shore. This search resulted in the discovery of a good number of small arrow-heads, fragments of stone pots, and numerous chips and flakes. In many places the soil bore evident marks of fire; some small bones of birds, which had apparently been burnt, were scattered thereon. The arrow-heads, with the chips and flakes, lay together in small groups.

Conche Harbour [Plate ix].—A triangular-shaped peninsula is connected with the mainland by a narrow neck of land about a quarter of a mile wide, which separates the harbours of "Conche" and "Range." The highest part of the peninsula lies to the east, which is terminated on the coast-line by lofty and precipitous cliffs. On the west side the ground slopes gradually down towards the sea, and a level area between the foot of the sloping ground and the landwash is in part covered with marshy meadows and partly by a bare pebbly beach, on which are built the houses of the fishermen. The rocks in the harbour were formerly much frequented by bay seals. Near the southern end of the peninsula, on a sloping bank, about 28 feet above the sea, was discovered the collection of small stone implements described. A fisherman, named Flynn, who owns the ground at that spot, informed me that whilst clearing away the turf for a potato garden, he came upon what he supposed were the remains of a burial-ground. As well as he could remember, the following appearances presented themselves. Below the

surface of the turf, at a depth of about eighteen inches, three occurred, in descending order:—

1. A layer of yellow clay ;
2. A layer of charcoal and ashes ;
3. Slabs of large and small stones ;
4. Human skeletons arranged in *natural* position, the bones of which crumbled to pieces on being touched. With them were mixed bones of seals and whales. The deposit of bones extended over the whole area of the garden, and may have continued beyond it ; he also found measures, stone pots, "drinking-cups" of stone, some whole and others in fragments, and a stone "knife," about eighteen inches long.

A crop of potatoes standing in the garden prevented me from making a thorough search there ; but on scooping amongst the soil in the furrows I gathered up pieces of clay, some decayed bones, and a few arrow-heads and flakes. Around the outside of the fence, however, a piece of a stone pot, smoothed on the under side, and showing the marks of a tool, and some pieces of charcoal, were found under the turf.

Having several days at my disposal, I set the Indian guide and one of the crew of our schooner to strip off the turf from the surface of a low sloping bank lying at a distance of about fifty yards from the garden. Underneath it, in the black soil, the greater number of the smaller implements were discovered. On the surface of the rock, forming part of the slope of the bank, the best finds were made. This spot is indicated by a cross on the map (Pl. ix.). At Sop Island the greater number of the implements were also found along the slope of a bank ; but too much stress must not be laid on the circumstance, because in several places on the level ground arrow-heads turned up in considerable quantities in proportion to the size of the area searched. The average depth of the surface of the rock below the turf was from a foot to eighteen inches. Occasionally pieces of stone pots, and smooth, oval-shaped pebbles were met with ; the latter did not bear either marks of fire or signs of having been used. Pieces of charcoal and chips denoted the presence of worked implements, as at Sop Island. At Conche Harbour a musket bullet, much corroded, was found in the river bank, just below the surface of the turf, which is about one foot thick.

No remains of any implements of bone or horn were discovered.

Small lumps of a black, carbonised substance, containing flakes and small pebbles, together with pieces of charcoal, were found in places. The freshly broken surfaces of the agglomerate show a shining lustre like bitumen. Small pieces of it placed

on a red-hot coal burn with a clear flame, and give off a faint smell. This substance has probably been formed by the flowing over, on to the ground, of seals' fat during its conversion into oil by boiling.

The collection made at Conche Harbour was the result of two men's work for two days and a half.

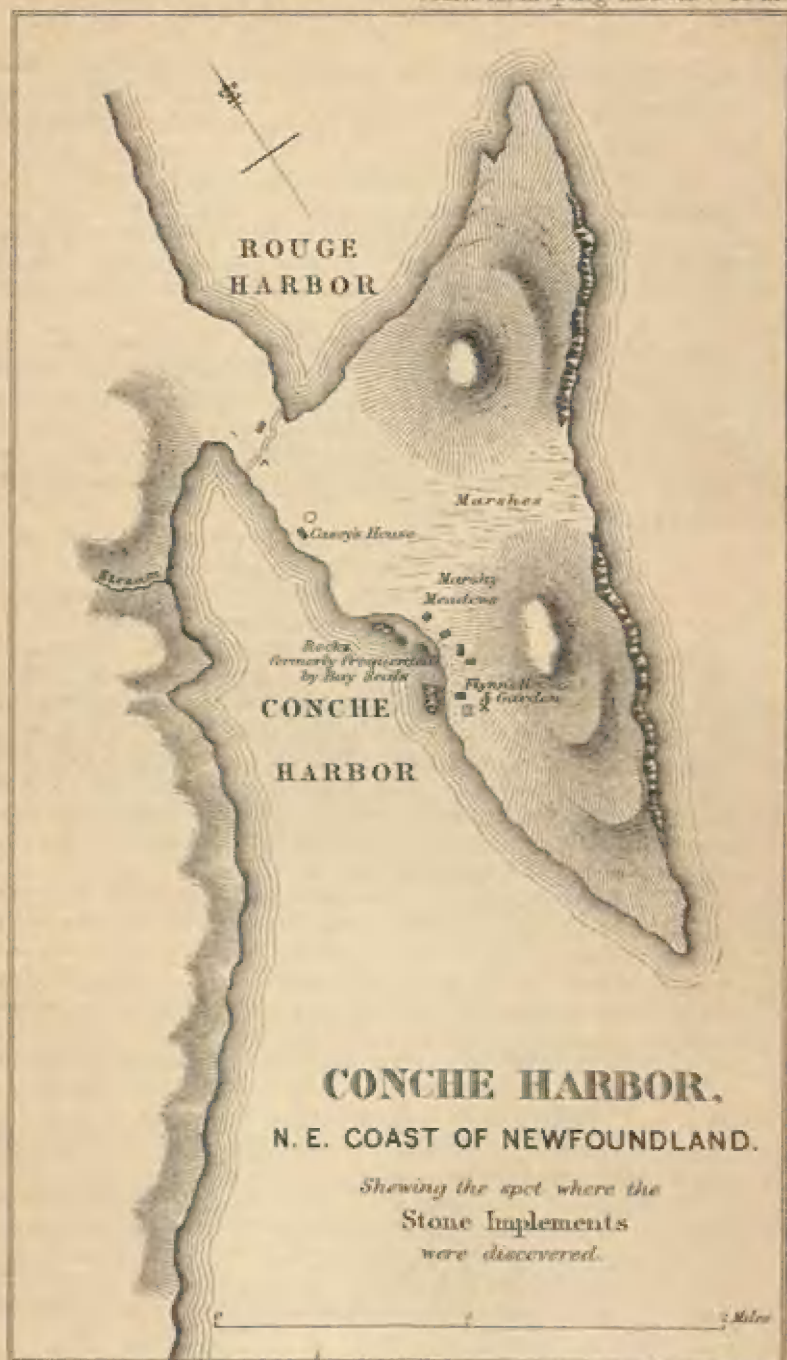
Judging from the vegetation now growing in the neighbourhood, it appears probable that formerly the land was covered with brush, consisting of dwarf Arabian fir, of which the greater part has been cleared away by the settlers.

Description of the Stone Implements.—They may be conveniently divided into nine classes, viz.:—1. Axe- and chisel-shaped tools. 2. Gouge-shaped tools. 3. Broken stone pots. 4. Sinkers. 5. Spear- and arrow-heads. 6. Scrapers or planes. 7. Fish hooks. 8. Objects in the course of manufacture, cores, flakes. 9. Whetstones, rubbing stones, and other miscellaneous articles.

1. These implements appear to have been fashioned out of rough pieces of stone by the simple process of rubbing down one end to a chisel-shaped edge. Two are of a soft magnesian stone. Fig. 4, Pl. x., represents an instrument which is the largest and most symmetrical of any I have seen, and is composed of chloritic slate. It has been used as a whetstone. Fig 5, Pl. x., is said to have been taken out of a Red Indian wigwam in the year 1810. The man who got possession of it said it fell out of the hand of an Indian, who was apparently occupied in skinning or cutting up some animal, as it was found to be covered with blood. The dark-coloured marks upon it may have been caused by blood-stains. None of the tools show any indications of having been mounted on handles.

2. These also appear to have been manufactured from any suitably shaped pieces of stone which came to hand. An exception to this, however, is manifest in the large and highly finished implement of chert shown in a photograph which was exhibited. It will also be noticed that the smaller ends of the specimen represented in fig. 5, Pl. x., and of another specimen exhibited, have been ground to an edge. The latter was found amongst the arrow-heads and other articles on the bank before described. The material is of soft magnesian stone and hardened clay. All the articles belonging to classes 1 and 2 show marks of fracture on their bevelled edges.

3. A comparison of the fragments of the stone vessels indicates that the larger ones, when whole, were from eight to nine inches in length and breadth, and about four or five inches in height, with a depth inside of some three inches or thereabouts. The smaller vessels were about the size of the one in the photograph,





described at p. 33 of my first paper. One specimen appears to be a portion of a small oval-shaped vessel. The section of one, restored as in the woodcut, shows the original shape of one of the vessels. The sides slope outwards, and diminish in thickness towards the top. In some of them the rounding of the edges of the bottom is much greater than in others. The material of which the vessels are composed is impure steatite. It is found in abundance on the north-east side of Newfoundland.*



Section through centre of a stone vessel, one-eighth original size.

It is obvious that the terms *Potstone* and *Lapis ollaris* imply that the material has been extensively employed in making utensils.

It will be observed that there are in some of the fragments small holes, made by some sharp-pointed instrument. Their purpose may have been to serve for the attachment of some kind of fastening to bind the broken pieces together. An Eskimo lamp of steatite, in the Christy collection, has a hole at each of the four corners for suspension. At p. 114 of "*Wilde's Catalogue of the Museum of the Irish Academy*" is a description, accompanied by a sketch, of a bowl-shaped vessel of impure potstone found in the Shannon excavations. It is described as a drinking-cup, and has the following dimensions:— $4\frac{1}{2}$ inches across the bowl, $5\frac{1}{4}$ inches as measured from end of handle to outside of rim, and $1\frac{1}{4}$ inch in depth. It appears from the sketch to have a small hole, which passes through from the handle into the interior of the bowl. If so, it may have served to carry a wick. In "*Wilson's Prehistoric Annals of Scotland*" (p. 147, 1st edition), a reference is made to some rude vessels of *Lapis ollaris* from the Island of Uyea. In shape and construction they differ from the stone vessels from Newfoundland.

The pieces of stone pot, when freshly dug up, were covered with a coating of the black soil in which they were found; besides which there was a hard layer of some black-coloured substance adhering firmly to the surface of the stone, which strongly resembles the cementing portion of the agglomerated mass already described. The larger stone vessels were probably used for boiling seals' fat, and the smaller ones, as suggested to me, may have been designed for lamps, as amongst the Eskimos. There is a small bowl-shaped vessel in the possession of Captain Knight, of St. Johns, Newfoundland, which much resembles some of those found in Scotland and Ireland, excepting that it has no handle. One of the same kind was found by Mr. Flynn in his garden,

* Dana, in his work on "*Mineralogy*," gives the following description of it:—"*Potstone* or *Lapis ollaris* is ordinary soap-stone, more or less impure. Slabs of steatite are extensively employed as fire stones in furnaces and stoves."

according to his description of it. He used it for some time as a saltcellar.

4. At page 35 of my former paper I described an egg-shaped piece of soapstone, which I stated, in my opinion, had been used as a sinker for a fishing line. Since then I procured three other stones of a somewhat egg-shaped form from the so-called Indian burial ground in Nôtre Dame Bay, one of which confirms, I think, my inference regarding its use. It is a small oval piece of soapstone, $1\frac{1}{4}$ inch long, pointed at the lower end (Pl. xi. fig. 14*). It has two shallow grooves—one horizontal and the other vertical—for the attachment of a line. On one side of the object there is a hook-shaped projection, which suggests the idea of a combination of sinker and hook for catching small fish. The sinkers without hooks may have been used with the hooks of stone, to be described further on. There is a method of catching lake trout in Canada as follows:—A small leaden sinker is fastened to the end of the line, above which is attached the hook. The sinker rests on the bottom, as in the ordinary Pater-noster line.

5. Mr. John Evans, in his standard work on "Stone Implements," places the javelins and arrow-heads under the same heading, and remarks on the difficulty of distinguishing the one class from the other. The excess in numbers of the specimens in my collection, which are usually classed as arrow-heads, over those as to which, from their greater size, some doubt may exist, will make it more convenient to adopt a similar arrangement. Taking as my guide the classification given in chap. xvi. of Mr. Evans's book, I have divided the specimens into the following classes:—(a) Stemmed arrow-heads; (b) double-barbed triangular ditto; (c) abnormal forms.

Class a.—Two specimens. The larger one belongs to a kind not unfrequently found in Newfoundland. In my former paper I described one of them (see Pl. x. fig. 1) as a rudely-formed spear or arrow-head of a soft red slate, from Torlinguet Island. Judging from a perfect one of the same kind which I saw at St. Johns, Newfoundland, the one under consideration must have been from five-and-a-half inches to six inches in length, and, therefore, was more adapted from its size to form the head of a spear. The smaller one is of the same type and material as those marked A A A, *loc. ant. cit.*, only the tang is more neatly made.

Class b.—In point of numbers and excellence of workmanship, this forms the most important group. The specimens belonging to it show a gradual diminution of length from about three

* The lithographer has unfortunately represented this sinker in an inverted position. The pointed end should be directed downwards.



Fig. 1.



Fig. 2.



Fig. 3.



Fig. 4.



Fig. 5.

inches down to five-sixteenths of an inch. They also differ in the relation of the lengths of the two sides to the base, thus giving to the more elongated forms a straighter contour in the sides than the shorter ones. Their bases are all hollowed out, some more than others (see figs. 9, 10, 11, 13; Pl. xi.). The larger ones have a notch cut in them on either side, near their bases; but in two instances where the bases are not hollowed out, there appear to be two notches instead of one on the same edge. The arrow-heads are made of hornstone and quartzite, which, judging from the finish of some of the specimens, form excellent materials for the purpose. Some of the specimens seem to have undergone the action of fire. One of the arrow-heads of quartzite shows marks of wear near the point. In a paper by Mr. Franks, F.R.S., &c., in the "Trans. Inter. Con. of Prehist. Archaeology," for 1868, p. 267, is figured an arrow-head (fig. 1) which much resembles the shorter specimens from Newfoundland, but is apparently not so highly finished. At p. 29, in "Field and Forest Rambles" of Dr. Leith Adams, are figured two notched arrow-heads with square bases, from New Brunswick.

Class c.—Three specimens are exhibited. Fig. 3, Pl. x., represents a broad, flat implement of chert, of a somewhat leaf-shaped form. The base, above which are two notches, is slightly hollowed out. It is finely serrated all round the edges. Another specimen exhibited, but not figured, is an unequal-sided spear- or arrow-head, but of hard grey-coloured slate. It is more triangular in outline, and it agrees with it in having a sharp edge, a notch on either side, and a slightly hollowed-out base.

Fig. 13, Pl. xi. is of a triangular form, and of a ruder description than the preceding ones; like them it is notched and hollowed-out at the base. It appears to have been burnt in the fire.

Mem.—In the Christy collection, with one doubtful exception, all the notched spear- or arrow-heads are North American.

6. Is a group (of about fifty in number) of the class of implements generally termed "scrapers," for which various uses have been suggested—such as for scraping skin and planing wood; as also for the manufacture of articles of horn and bone, for fabricating arrow-heads and knives of flint, and as strike-a-lights.*

* Mr. John Evans, in the work before quoted, says of North American forms, at p. 362: "The arrow-head with a notch at the base on either side is a prevailing type in North America. The triangular form, usually but little excavated at the base, is also common there. For the most part the chipping is but rough, as the material, which is usually chert, hornstone, or even quartz, does not readily lend itself to fine work. They were made of various sizes, the smaller for boys, and those for men varying in accordance with the purpose to which they were to be applied."

The implements of this description from Newfoundland are more or less of a triangular form (see figs. 4, 5, 6, 7, Pl. xi.). They vary in length from about two inches to half-an-inch. The majority of them are made of hornstone. Two of them, however, are composed of opaque quartz, and one of hyaline quartz (fig. 6. Pl. xi.).

As well as I have been able to judge from a careful examination of their edges, none of them exhibit unequivocal signs of wear, such as I should imagine would be produced by planing wood or any hard substance. Nor do they show a smooth polish on portions of their top and bottom surfaces, such as would result from the process of hafting, like the tools fitted into handles by the Eskimos. The only signs of polish observable have been, probably, produced by blows of a pickaxe when grubbed up.

In some of the larger specimens the smooth surface, which formed the inside of the original flakes, increases in curvature from the butt end to the rounded edge, varying in sharpness of curve with the line of fracture (see fig. 4, Pl. xi.).

A peculiar form of scraper is exhibited. It is equilateral in shape, and shows signs of chipping all round the edges. On the upper and lower sides a portion of the surface is broken in an irregular manner, as if it had been struck by the repeated blows of some pointed instrument. It is, however, difficult, in most cases, to distinguish the marks of original chipping in the process of manufacture from those occasioned by subsequent use.

7. These peculiarly-shaped objects (figs. 1, 2, 3, Pl. xi.) appeared to me, when I first discovered them, likely to have been used as scrapers for rounding the shafts of arrows; but Mr. Franks has suggested they are the points of fish-hooks fastened into shanks of bone, which latter were bound round the end of a slip of wood. Such articles are used by the Eskimos. (See Klemm, "*Werkzeuge und Waffen*," 1858, p. 61.)

8. These consist of cores of hornstone, a number of flakes and chips, with a quantity of the raw material of quartz, hornstone, &c. Amongst them are some small flakes of transparent quartz, similar to those in the Eskimo case in the Christy collection.

9. Amongst this group, one object particularly attracted my attention on picking it up (Pl. x. fig. 2). It is a thin piece of micaceous slate, about 4 inches long and $\frac{2}{3}$ of an inch broad near the middle, and tapers towards both ends. After removing a portion of the red ochreous coating by washing, an examination showed four groups of small notches, arranged on one side





Fig. 1



Fig. 2



Fig. 3



Fig. 5



Fig. 6



Fig. 8



Fig. 9



Fig. 10



Fig. 11



Fig. 12



Fig. 13



Fig. 14



Fig. 15



Fig. 16

of the stone, at pretty nearly equal distances apart. The notches are all about the same length.

Besides this, there are two awl-shaped tools of hornstone, somewhat similar in shape to the one figured in "Ancient Stone Implements" (fig. 227, p. 289). They differ from it, however, in the absence of chipping at the sides. One of them shows marks of wear at the point; the other is partially serrated on one side. It is stated in the work above referred to that similar boring instruments of flint have been found in Denmark, in company with scrapers and other tools. The holes in some of the fragments of stone vessels may have been bored with such like instruments. The rubbing stone and flat pieces of slate, apparently whet-stones, do not require any special remarks.

Suggestive remarks on the probable use of the implements belonging to Classes 1, 2, and 6.

I premise that the names "axes," "chisels," and "gouges," have been given to certain stone implements from their resemblance to the ordinary forms of such tools of steel as are in use amongst the carpenters of the present day, and I have no doubt that in many cases these terms are applicable to them. In many parts of the world the natives use them for cutting wood and cleaving skulls. The New Zealanders employ them for cutting wood, &c., and in North America the charred trunks of trees are fashioned into dug-out canoes by their means, the hardness of the material giving to them the necessary qualification of a cutting instrument. The implements from Newfoundland belonging to the same classes are, I venture to think, with one exception,* but ill-adapted for such purposes. They are made of a soft and friable stone, and would soon become useless. Schoolcraft (vol. i. p. 91) says: "Fleshing instruments of stone are often mistaken for a small axe." He then goes on to describe a species of hand-chisel, blunt, that it may not cut the skin, and yet of sufficient edge and hardness to permit of a stout, jerking blow. "It required no crease, as if to bind it, and was often of very rude workmanship."

Amongst some notes on the Eskimo seal fishery on the north-east coast of Labrador, given me by Captain Arthur Juckman, of St. Johns, an experienced sealing skipper, I find the following account:—"Having previously 'skulped' (taken out the entrails and removed the skin), the Eskimos separate the fat from the seal's skin with an 'oodloo.' After having dried the

* The "cut-throat," or knife used by the Newfoundland fishermen for splitting codfish, much resembles in shape the quartzite implements found at L'Anse du Diable, Labrador. (See paper on them.)

skin on a frame, they scrape it with an iron instrument about 4 inches long and 3 wide. The tool is bent round into a gouge-like shape, and is fastened by nails or rivets to a wooden handle. The tool is grasped in the middle of the hand, and by a thrusting movement the Indian scrapes away the vellum from the inside of the skin. The part of it under treatment rests on a wooden board lying on the knees of the operator. The hair is taken off by the oodloo."

As another instance of the employment of gouge-shaped instruments in preparing skins, I will mention the method practised by the Montagnards of the interior of Labrador. The instrument, which is called by the Micmac Indians "Saskadedagan," some few of whom use it in preference to the ordinary "Jee-ge-gan," or scraper, is made by chopping through the leg-bone of a bear in an oblique direction.* The rounded end thus produced is notched with a file, so as to form a serrated edge. A quantity of shot is then plugged up in the hollow of the bone, to give it weight. A strap of sinew or a cord is passed through two holes bored in the articular end of the bone. The implement is used in the following manner:—The deerskin is first of all thrown over a post stuck upright in the ground. A fold of it is then grasped tightly in the left hand, and drawn in a slanting direction towards the body. The tool is then grasped in the middle of the right hand, with the strap passing round the wrist, to prevent the hand from slipping, and the operator detaches the vellum from the part of the skin above the left hand by a series of sharp downward blows.†

The Red Indian Pond trapper, Johnny Joe, told me he had used stone "gouges" found in Newfoundland for breaking holes in the ice to catch beavers. The ordinary tool for the purpose, as supplied by the Hudson's Bay Company to the Indians of Canada, is a common carpenter's chisel. Peculiar shaped chisels, of hammered copper, have been found in the district of the Ottawa river, which are supposed to have been used for a like purpose.

If the relative forms of the stone implements and the other tools

* For drawings of the Saskadedagan and Jee-ge-gan, see the author's paper on the 'Caribou of Newfoundland,' in final part of the "Reliquiæ Aquitanicæ," about to be published.

† The "Jee-ge-gan" is made out of the marrow-bone (metatarsal) from a deer's hind leg. The bone is split open with an axe for a portion of its length. The edge to be used for scraping is then thinned down to a sharp bevel on either side. The tool is grasped in both hands, and is pushed forwards against the skin with the scraping edge square with its surface. The skin is laid upon a post driven obliquely into the ground.

The Inland Columbians dress skins by spreading, scraping off the flesh, and, for some purposes, the hair, with a piece of bone, stone, or iron, attached to a short handle, and used like an adze. (Baneroff, p. 271.)

just described be taken into consideration, and allowance made for the softness of the material, in most cases, I think, we shall not be far wrong in arriving at the conclusion that the chisel-shaped instruments were used, amongst other purposes, for skinning seals and other animals of the chase; while the gouge-shaped tools served for removing the vellum from the skins, and both kinds were of service in hollowing out the vessels from the soft material of which they were composed. The question may be asked, "How did the 'stone people' cut their wood for firing?" In answering this question, it must be borne in mind that the semi-civilised Indian of North America, even with his tomahawk of steel, is very economical in the matter of wood. When camping without the company of the white man, who requires plenty of warmth, a few boughs are sufficient to make him a comfortable fire. His reply to the question, "Why do you not make a larger fire?" is, "Large fire no good; can't get near large fire; small fire, creep close." So that tools for hewing down trees to make big fire logs are not indispensable. It is a singular circumstance that no stone implements, as far as I am aware, have hitherto been found on the old camping grounds of the Beothucs in the interior of the island.

In the description given by Cormack of the interior of a "Red Indian" grave, no mention is made of any stone implements amongst the various articles deposited therein. (See "Journ. Anthropol. Inst.," vol. iv. p. 32.)

The Scrapers.—These form a series of implements of the hardest kind of stone, and are characterised by a similarity of form and style of workmanship. They vary in size down to such as can be conveniently grasped between the thumb and forefinger. The planes of their working forces meet at angles, which make them more suited for abrasion by a backward than by a forward movement of the hand. The hardness of the material may account in a measure for absence of any unequivocal sign of wear, and their mode of occurrence will render it probable that some of them at least had not been turned out of the workshop. I therefore venture to hazard the opinion, that amongst other uses to which they may have been destined, were the fashioning of arrow- and spear-shafts, much in the same way as broken glass is used at the present day. Although it may be objected that a square edge would have served such a purpose better, the wide application of tools for scraping purposes would not admit of forms specially adapted for one class of operation. They may also have served for scraping the vellum from the skins of such small animals as the beaver, musk rat, and hare. Whether they were also employed in the fabrication

of arrow- and spear-heads, I do not feel competent to form an opinion.

At this stage of the inquiry the question naturally arises, Who were the makers of the stone implements? According to the accounts of the early navigators who visited Newfoundland, it appears that the savages of the island painted themselves of a roan colour, used bows and arrows and spears, and killed a great store of the various animals of the chase. At that period, I imagine, they used only arrow- and spear-heads of stone. In later times, long after the first settlement of white people on the island, and when the "red men" had learnt, to their cost, the abuse of firearms, in exchange for the articles of iron and other metal which they pilfered from their merciless enemies, we hear they manufactured stone pots, and made use of stone implements in preparing skins, and found out the superior qualities of the steel axe and iron arrow-heads.

A comparison of the stone implements found in various parts of Newfoundland with those used by the Eskimo on the one hand, and others found in many parts of the American continent, shows that they have, as a whole, certain characters common to both classes. For instance, the chisel and gouge-shaped tools are of a type prevailing over a great part of North America. The arrow- and spear-heads exhibit no very distinctive forms, although those having notches in them are of the North American type. The scrapers, fish hooks, and stone vessels resemble those in use amongst the Eskimo. The latter were, it appears, manufactured in late times by the Beothucs, according to Mr. Peyton.

Sinkers of stone are used in trawling by the fishing Indians of Vancouver Island, and have been found in several places in North America. (See Evans, p. 212.)

The absence of any remains of earthenware in Newfoundland affords but little assistance in the inquiry, since amongst the Assineboines and the Eskimo the art of pottery-making is not known.

Any surmises regarding the age of the Indian relics from Sop Island and Conche Harbour must necessarily be vague, because the amount of time required for the accumulation of a covering of vegetable soil of a certain thickness cannot be accurately determined. The discovery of a musket-ball gives us no data to go by. However, as no articles of European manufacture have yet been found amongst the stone implements, we may, for the present, infer that they belong to a period antecedent to the settlement of Europeans on the island.

If it be allowable to draw any conclusions regarding the ethnic relations of different tribes inhabiting adjacent countries,

from the similarity or dissimilarity of their implements, it seems that the evidence is pretty equally divided between the Eskimo and the Beothucs. (I have omitted any mention of the Montagnards and Nasquapees in this connection, because I have failed in obtaining any information of their employment of stone implements.)

In default then of any existing knowledge of the occupation of Newfoundland by the Eskimo, although it is stated by Cartwright that they used to visit the shores of the island, as the Montagnards do now occasionally, I think that the balance of the evidence is in favour of the Beothucs as the aboriginal stone-folk of Newfoundland.

It will be seen from the preceding account of the aborigines of Newfoundland, that the "Beothucs," or Good-night Indians, possessed, in many respects, characteristics belonging to many of the tribes inhabiting the North American continent, whilst, on the other hand, they appeared to differ from them in certain peculiarities, which were as follows:—

1. Lightness of complexion.
2. The use of trenches in their wigwams for sleeping places.
3. The peculiar form of their canoes.
4. The custom of living in a state of isolation far apart from the white inhabitants of the island, and their persistent refusal to submit to any attempts to civilise them.
5. The non-domestication of the dog amongst them.
6. The art of making pottery was unknown amongst them.

In any endeavour to reconcile the peculiar characteristics of the Beothucs with those which mark other North American tribes, we must bear in mind the following circumstances:—Lightness of complexion cannot be considered as a distinctive mark of difference of race. Amongst the North American Indians are found tribes varying considerably in depth of colour, the copper-coloured tinge being peculiar to some of them, whilst others are not darker than Spanish gipsies.* See Haidahs of British Columbia and other coast races described in Bancroft's book.

The trenches used as sleeping places were probably designed for protecting the inmates of the wigwams, in case of surprise by their enemies, the white fishermen and Micmac Indians, and also as a shelter from the inclement winds of the spring and fall. The bank outside the trench would assist in keeping off the wind, which blew through the chinks in the birch-bark lining. In

* I have not included the practice of using unguents and painting with ochre amongst the peculiarities of the Beothucs, because similar customs are practised amongst existing tribes of North America.

camping out in the snow in Canada, I have experienced the good effect of a bank of snow piled up around the camp.*

The peculiar shape of their canoes was probably due, as I stated in my former paper, to an adaptation of form to circumstances. The Beothucs, who passed their summers on the sea coast, would require a boat capable of withstanding an ordinary sea, and well adapted for steering when used with a sail. A birch-bark canoe, having the ordinary rounded form of bottom and lowness of gunwale, would not be sufficiently seaworthy, I should imagine, for making such voyages as to Funk Island in search of Great Auks and the eggs of various sea birds.

The statement that the canoe could be folded up like "a cocked hat" seems to be a doubtful one. Even if it were capable of such an alteration in form, I do not think it would have added much to its portability.†

It is difficult to account for the fact that the dog was unknown amongst them, unless on the supposition that the Newfoundland dog of the island is not indigenous, but is merely the degenerate descendant of the "distinguished members of the Humane Society" belonging to the British Isles. It may have been introduced by the early colonists from England.‡ However that may be, so useful an animal to man is almost invariably found in company with the savage of America, and its remains have been discovered in association with those of prehistoric man in Europe. Even supposing the above supposition to be a correct one, it still remains a remarkable circumstance that the Beothucs should not have obtained it from their friends the Montagnards of Labrador.

The practice of making pottery is by no means universal amongst the Indians of the American continent. It is unknown amongst the Eskimo. The Apinulboines (or stone boilers) of the north-west, and the Montagnards of Labrador (according to Hind), make use of birch-bark cooking vessels, in which the water is heated by throwing in hot stones; it may be inferred that such a contrivance would scarcely be adopted by them if

* "The Kouragas make tomb-like excavations round the sides of the room, where the occupant reposes on his back, with his knees drawn up to the chin." —(Bancroft, p. 74.)

† "The Aleuts sleep in a kind of concave trench, which is dug all round the inside of the house." (Bancroft, p. 89, in a note.)

‡ Bancroft says of the dug-out canoes of the Puget Sound Indians: "The form varies amongst different nations according as the canoe is intended for ocean, sound, or river navigation, being found with bow and stern, or both, in various forms—pointed, round, shovel-nosed, raised, or level." (See Swan's "North-West Coast," pp. 79—82.)

‡ I am inclined to believe that such may be the case. The wolfish appearance of the Indian dog of North America contrasts strongly with that of the Newfoundland dog of both hemispheres.

they were acquainted with the art of manufacturing earthenware vessels.* The stone pots of the Beothucs appear to have been used for boiling deers' fat in, and may also have been used as lamps, like those of the Eskimo. As far as I am aware, none have been found sufficiently large for ordinary cooking purposes. They may have been used for boiling the tallow in the preparation of the pemmican before described.

The branches of the great Algonkin nation, recent and modern, include the aborigines of Montreal, the Chippeways and Crees of the north-west of Canada, the Montagnards and Nasquapees of Labrador, besides the Ottawas and Abenakis. In short, they embrace the whole of the Indian tribes, extending from beyond the head of Lake Superior to the Atlantic coast, with the exception of the Eskimos. To endeavour to trace out the origin of the Beothucs from among such a numerous assemblage of different tribes, having many characteristics in common, would be waste of time.

Some have, however, indulged in the supposition that the Beothucs originally came from Scandinavia. But before seeking for traces of them in so distant a source, it appears to me a more rational proceeding to attribute their probable origin to some ancient migration of a branch of the Algonkin nation, caused by their having been driven out by war, as in the case of the historical dispersion of the aborigines of Montreal by Iroquois and Hurons.

Some of the peculiarities which distinguished the Beothucs from other Indians of the Western Continent were of a kind such as might easily have arisen amongst a people debarred for a long period from free communication with other tribes. Others, in all probability, resulted from an alteration in external circumstances, which necessitated changes of habit and modes of life. In fact, they were an adaptation of requirements to means, such as might have originated among a people formerly living in the interior of a continent, but now compelled to obtain a livelihood under such altered conditions as an insular life would necessitate.

Regarding their ultimate fate, there is less difficulty in forming a reasonable conjecture. Amongst the various reports thereon to be found in the foregoing pages, those which seek to attribute their sudden disappearance to having perished on the island bear the strongest marks of truth about them, and the signi-

* Since writing the above, I have been informed that there are some boiling stones which belonged to the Beothucs in the Edinburgh Museum. They were presented, along with two skulls, to the late Professor Jameson, by Cormack, the explorer.

ficant fact, that about that time there only remained of them fourteen individuals. It may, I think, be reasonably concluded that these few poor wretches, forced to leave their habitations and wander about during the severity of winter, eventually died of starvation on the island; thus affording another instance of a people "improved off the face of the earth by the bearded stranger from the rising sun."

My best acknowledgments are due to Mr. A. W. Franks for much advice and assistance during the preparation of the foregoing pages; and to Professor Busk, for the descriptions and drawings of the Beothuc skulls. I am also much indebted to Mr. John Evans for his valuable work on "Stone Implements," without which I should not have attempted the task of describing the stone implements of Newfoundland.

EXPLANATION OF PLATES IX. TO XI.

Plate IX.

Map of Conche Harbour, on the north-east coast of Newfoundland. The spot where the stone implements represented in the succeeding plates were found is indicated by a small cross.

Plate X.

Fig. 1. Broken spear-head of soft red slate, one-half natural size. 2. Fragment of micaceous slate, exhibiting four groups of small notches on the sides, one-half natural size. 3. Thin, broad, leaf-shaped arrow-head of chert, with finely-serrated edges, one-half natural size. 4. Chisel or axe of chloritic slate, one-third natural size. 5. Gouge-shaped tool; the hollowed-out end is directed upwards in the figure; the other end has been ground to an edge; one-third natural size.

Plate XI.

Figs. 1 to 3. Stone objects, probably the points of fish-hooks. 4 to 8. Various forms of stone scrapers. 9 to 12. Triangular stone arrow-heads, with hollowed-out bases. 13. Triangular stone arrow-head, hollowed out at base, and notched on each side. 14. Soapstone sinker for fishing net; the pointed end should have been directed downwards.

N.B.—All the objects in Pl. xi. are figured of natural size.

Mr. PARK HARRISON exhibited a series of Photographs of Easter Island Tablets, and read the following note:—

NOTE on *see* HIEROGLYPHIC TABLETS from EASTER ISLAND.
By J. PARK HARRISON, M.A.

THE discovery of three incised tablets of hard wood in some of the houses in Easter Island was alluded to in this Journal, and a

minute description of them given two years ago. Since then I had obtained from Mr. Croft, a resident in Papeete, photographs of five others, from four inches to three feet in length, which had been received subsequently by the French mission in Tahiti from Easter Island. It appears from the letter that accompanied them that these tablets were once very numerous; but owing to intestine wars, and the anxiety of the Roman Catholic missionaries to destroy all relics of heathenism, many have been burnt. Natives of Easter Island say that some of these tablets contained a portion of the ancient history of the island, its kings and chiefs; others mythological legends and heathen prayers; and some, directions for fishing and planting. It appears that the art of deciphering the signs was confined to the priests and some few others, who are supposed to be now dead. An Easter Islander in Tahiti professed to be able to read the hieroglyphics, but, on being shown one of the tablets, was unable to do so. He had been partially instructed when quite a boy, but could only say that the signs represented "ideas and sentences."

As one of the tablets, now at Santiago, of which plaster casts are preserved in the Museum of the Institute, appeared to me to be pictorial, I sent copies of the heliotypes that had been taken of it to Tahiti, to see if any of the Easter Islanders could explain the signs upon it; and find, from a letter just received in reply, that the tablet alluded to is one of those that "says a good deal about their chiefs," and that some of the explanations I offered are correct. Further information is promised.

It will be remembered that one of the scenes that it appeared probably were purely pictorial, was a festival such as often occurs in the Pacific when a great haul of fish is obtained. The natives are seen dancing separately, some of them holding fishes in their hands, whilst an attempt to represent distinct kinds of fish is recognisable. Two pillars, each one with an arm attached to it, appear to have been "set up for the spirits,"* and may possibly be sun and moon-stones. Figures of a different type from the natives who are engaged in the dance are standing by.

Another picture seems intended to represent a procession of bird-headed men who are approaching a pillar with circles on each side of it.

It need scarcely be added, that great interest attaches to these tablets, owing to the fact that nothing of the kind has been met with hitherto in the Pacific, and they are found associated with circumstances that point to a survival of an early state of civilisation. According to the legends of the islanders, and pre-

* See Sir G. Grey's "Polynesian Mythology," page 214.

served probably by their engraved tablets, they came from the West in large vessels. There is reason to believe that many more tablets still exist in the island; the natives, who are dying out fast, attach the greatest value to them, and carefully conceal them.

The signs in the photographs exhibited on this occasion are symbolic, and appear to be connected with the mythology of the islanders.

MR. BOUVERIE-PUSEY remarked, that he had read somewhere that picture-writing existed in the Caroline Islands. As there was every reason to suppose a connection between the extinct culture of Easter Island and that of Micronesia, he thought it would be an interesting subject for investigation whether any affinity existed between the hieroglyphics of the two places.

MR. E. B. TYLOR thought the number of Easter Island inscriptions now collected would justify the investigation being carried into the second stage—that of tabulating the various pictures or symbols employed, to ascertain how often and in what connection they occurred. He called attention to some which had ceased to be pictorial, and had passed into regular symbolic characters, repeated from time to time with variations.

MR. GEORGE ST. CLAIR said, that one of the figures bore some resemblance to the eagle-head deity in the Assyrian sculptures, making an offering to the sacred tree. This might indicate a connection, if not between the peoples, between their mythologies; and he thought it was not the only point where the mythologies seemed to touch.

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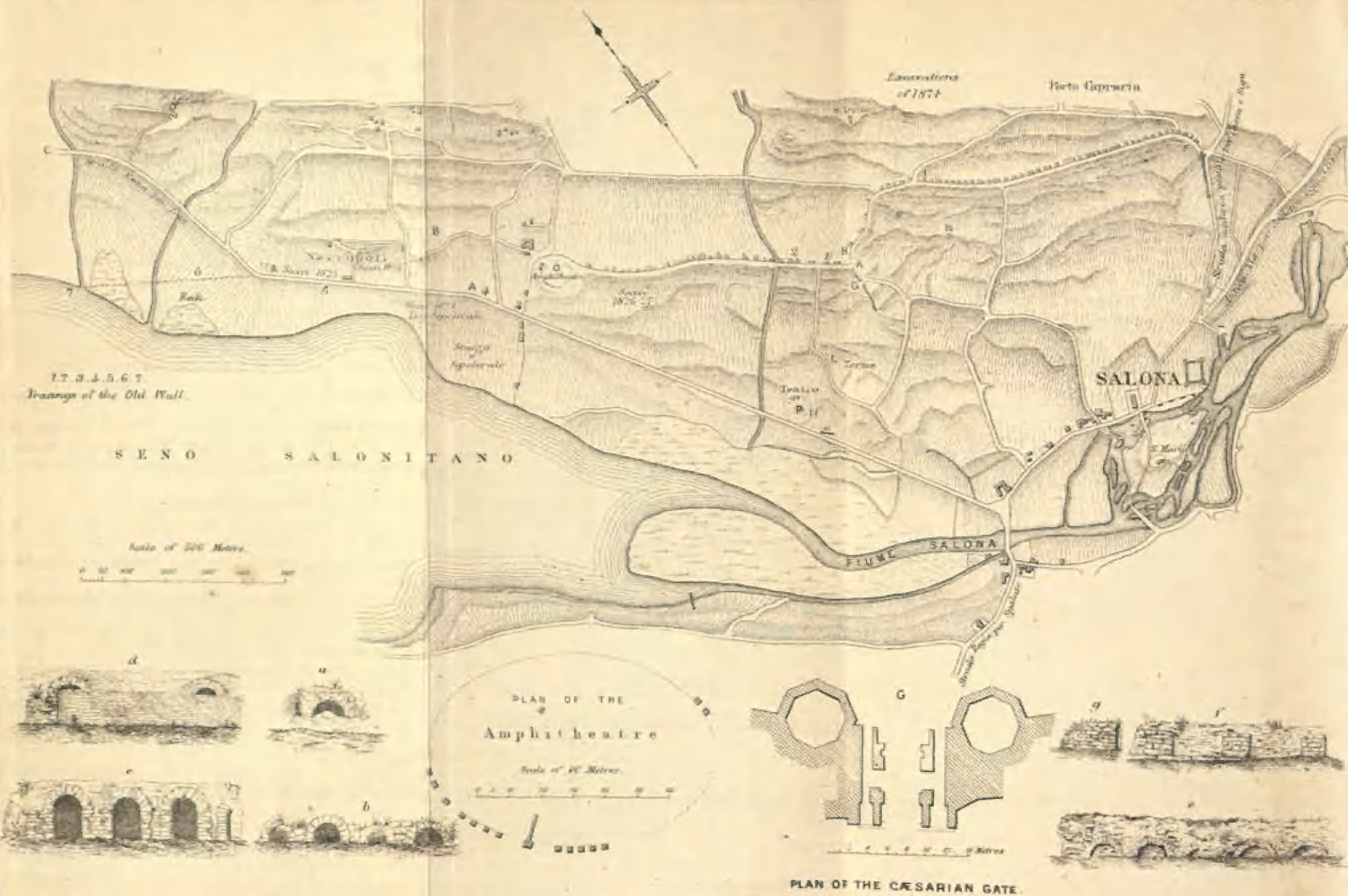
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THE JOURNAL
OF THE
ANTHROPOLOGICAL INSTITUTE
OF
GREAT BRITAIN AND IRELAND.

JUNE 8TH, 1875.

Colonel A. LANE FOX, *President, in the Chair.*

The minutes of the last meeting were read and confirmed.

The election was announced of ROBERT PHILLIPS GREG, Jun., Esq., F.G.S., F.R.A.S., of Coles Park, Buntingford, Herts.

Thanks were voted for the following presents received :

FOR THE LIBRARY.

- From the AUTHOR.—Rude Stone Monuments. By Rev. W. C. Lukis, M.A.
- From the ROYAL GEOGRAPHICAL SOCIETY.—Arctic Papers for the Expedition of 1875.
- From the SOCIETY.—Bulletin de la Société Impériale des Naturalistes de Moscou. Vol. XLVIII. No. 3.
- From the EDITOR.—Revue Scientifique. Nos. 47 and 48. And Tables des Matières.
- From the ACADEMY.—Proceedings of the Royal Academy of Copenhagen. No. 2, 1874.
- From the SOCIETY.—Transactions of the Asiatic Society of Japan. Vol. III. Part I.
- From the SOCIETY.—Mémoires de la Société Royale des Antiquaires du Nord. 1866.
- From the INSTITUTION.—Journal of the Royal United Service Institution. Vol. XVIII. (Appendix).
- From the AUTHOR.—United States Geological and Geographical Survey of Colorado, 1873. By F. V. Hayden.
- From the INSTITUTION.—Journal of the Royal Institution of Cornwall. Vol. XVI. 1874.
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From the AUTHOR.—Illustrated Catalogue of the Canterbury Museum. By John Brent, F.S.A.

From Mrs. JACKSON.—Ethnology and Phrenology. Second edition. By the late J. W. Jackson.

The following paper was read by the author :

The LONG WALL of SALONA and the RUINED CITIES of PHARIA and GELSA DI LESINA. By Captain R. F. BURTON, H.M. Consul at Trieste. [With Plates xii. and xiii. and woodcuts.]

INTRODUCTION.

ALLOW me to begin by expressing the great satisfaction with which I find myself once more in this room, and permitted to offer you the results of three years' work. The specimens on the table will show you the nature of that work, and, before proceeding to the papers announced for this evening, I may, perhaps, be allowed briefly to introduce them to you.

The two sketches (Pl. xiii. figs. 1 and 2) represent the only flint implements as yet found in Dalmatia; and I have added the requisite details. They were shown to me by my learned friend, Prof. Glavinić of Spalato. I would propose him and Dr. Lanza di Casalanza as corresponding members of our Society; and I will answer for their value.

The skull and the accompanying bones were found near Bolliunz, a valley about five miles south-east of Trieste. Here the Romans cut an aqueduct in the live rock—a trough which supplied Tergeste with the best water. I have no doubt that some of the caves which now appear natural were hand-worked for mortuary purposes; and, though I will not answer for the skull being Roman, or, indeed, of any great antiquity, I think that it may be a relic of the ancient race, and, as such, I have brought it home for the collection of our learned associate, Dr. J. Barnard Davis.

The collection of pottery and the models of stone implements are intended for the admirable collection of our President, Col. A. Lane Fox. They are gathered from the Castellieri of Istria, concerning which I lately published a paper, with many regrets for the mode in which it was published, and a heartfelt resolution not to do it again. The pottery is submitted to the judgment of experts. To an amateur it appears of different epochs, but I can answer for the fact of its being an authentic find—most of it was dug up in my presence. It occurs in the black earth.

PART I.—THE LONG WALL OF SALONA.

Salona wants but few words of introduction. She was in turn the *Respublica Salonæ* (inscribed on leaden tube of aqueduct); the *Conventus* and *Colonia* of Pliny (iii. 22), and a host of writers; the Roman metropolis of *Dalmatia Felix*, that fair and fertile section of the land between the *Nestus* or *Tilurus* (mod. *Cettina*) and the *Naro* (*Narenta*) rivers; a *Præfectura* et *Prætura* (*Farlati Illyria Sacra* i. 27), with a *Præpositus thesaurorum*; a *Procurator ginæciorum*; a *Procurator baphiorum* (of the dyeing establishments); and a *Præses Dalmatiæ* (or *Functionarius perfectissimus*). She was the great emporium of the coast, the *ἐννεῖον*, or naval arsenal (*Strabo*, vii. 5); and the "*Totius Dalmatiæ Caput*" (*Const. Porphy. de Admin. Imperii*, cap. xxx.) which, under Augustus, included a part of Western Pannonia. *Virgil* (*Genethliacum*, *Ecl.* iv.) sang the birth of a "*Saloninus*," and the glories of the paternal triumph: *Horace* (ii. 1) immortalised the honours of Dalmatic or Delmatic victory. Here "*Duke Bato*" (A.D. 6, *Dion Cassius*, lib. lx., and *Vell. Paternulus*, lib. ii.) fought for liberty against the predatory and oppressive masters of the world; here *S. Domnius* (*S. Doimo* or *Dojmo*) was sent, according to old tradition, by *Saint Peter*; and here *Titus*, by order of *Saint Paul* (*Tim.* ii. 4-10) preached the gospel to Dalmatia. The remains of what an English novelist called the "small but prosperous town of Salona" (?), though seldom visited, are, according to *Prof. Steinbüchel*, some of the most interesting of classical ruins. Finally, a highly advantageous position has made *Spalato*, its modern *locum tenens*, the natural, whilst *Zara* is the artificial and political capital, and the most flourishing, indeed the only progressive port of the old "*Regno di Dalmazia*," which still forms the southernmost province of the extended Austrian empire.

But my business at present is with a single section of Salona, the "*Long Wall*," of doubtful and debated origin.

The celebrated *Abate Alberto Fortis* (*Viaggio in Dalmazia*, *c.c.* 2 vols., *Alvise Milocco*, Venice, 1774, translated into English (London, *J. Robson*, 1777), and French, "*Voyage en Dalmatie*, Berne, chez la *Société Typographique*, 1778"),* who travelled in A.D. 1770-1772, and whose meritorious labours have been a mine copiously quarried by later writers, has no notice of the "*Murazzo*," or long wall, although he gives a detailed description of the ruins of Salona, in his vol. ii. p. 42 (French translation, ii. sec. iii. p. 56).

* I shall give in these pages references to text and French translation for facility of reference. The book has become somewhat rare and costly.

On the other hand, the late Mr. Paton, so well known as a traveller, and a writer of travels, and mentioned with respect by the late Abate Carrara, visited Salona in 1846-7, and describes this most interesting feature in the following remarks (vol. i. 363, "Highlands and Islands of the Adriatic," by A. A. Paton, 2 vols. London: Chapman and Hall, 1849):

"To the westward of Salona is a remnant of an immense construction, the origin and destination of which is quite unknown to the local antiquaries—a *Cyclopean wall*,* of regular quadrilateral stones, each from 8 to 16 feet in length. At first sight, I imagined that it must have been the foundation of a temple; but, as it extends 580 paces in length, I soon saw the fallacy of that opinion."

The generic term, "Cyclopean," is given to the blocks 6 to 12 feet long by 2 to 5 high, at Tiryns, in Argolis, by Pausanias (*Κυκλώπων . . . ἔργον* ii. 25-7); but he also applies it to the hewn polygons of Mykenæ, and even to the squared masonry of the Gate of the Lions. Euripides repeatedly adapts the same expression to the walls of Mykenæ and of Argos. Lactantius (vid. Stat. Theb. i. 252) explains it thus: "Arcees Cyclopum autem, aut quas Cyclopes fecerunt, aut magni ac miri operis; nam quicquid magnitudine sua nobile est, Cyclopum manu dicitur fabricatum." Of course the picturesque term was seized upon by the imitative Roman poets: Seneca, to mention no other, says:

Quid moror? Majus mihi,
Bellum Mycenis restat, ut Cyclopea
Eversa manibus saxa nostris concidant.
(*Herc. Fur.* iv. 996.)

The first step would be to smooth the joints, as in the artistic walls of Cosa, and the outer surface, as at Rusellæ, after which the whole stone would be hewn first to the pseudo-isodom, and, lastly, to the isodomie form. Petit-Radel and Dennis (ii. 284) hold the polygonal structures to be Pelasgic, and the former declares (*Mem. Inst.* iii. pp. 55-66) that they have been found as far south as Lucania and Apulia. Mr. Hamilton ("Archæologia") complicates the use of the word by applying it to four several forms of masonry, noting as many different epochs. In the first, the gigantic, irregular blocks are of various sizes, with smaller interstitial stones, but wholly without mortar (Tiryns and a portion of the Maltese "Torri de' Giganti," unhewn masses of coralline). The second shows masonry without courses, irregular polygons whose sides fit closely (Mykenæ, Etrurian

* The italics in this passage, and in the quotations from Sir Gardner Wilkinson and the Abate Carrara, are mine.

Norba, Cære, Arpino, Cosa, and Alatri; also Iulis (of Ceos) and Delphi; in the third, the strata are of the same height, but pseudo-isodomic, or unequal in length of stones (Bœotia, Argolis, and the Phocian cities); whilst, fourthly and lastly, the blocks are of different heights, but always rectangular (Attica). "Rectangular Cyclopean" sounds almost like an Irish bull. Perhaps we had better, with Dodwell ("Pelagic Remains") and Sir William Gell ("Rome"), despite Bunsen (Ann. Inst., Rome, 1834), limit the term "Cyclopean" to masonry composed of irregular polygons of large size, superimposed and fitted together, more or less closely, with interstitial stones, but without mortar or cement. The oldest form would be a massive wall formed by huge blocks of undressed rock simply piled together without much care for jointing, as at Sidon, and in the Castellieri of Istria, especially that of Cunzi (Kunzi). Similar walls are found at Segni, Alatri, and other Etruscan cities, as opposed to those of Latium. In the second, the sides would be smoothed so as to correspond, but the stones would not be laid in true courses; such are the ruins of Tiryns.

The next traveller of note to Salona, the late Sir J. Gardner Wilkinson ("Dalmatia," &c.: London, Murray, 1848), avoids using the terms "Cyclopean" and "Pelagian,"* and describes (i. 160-1) the "wall of large stones" in these words:

"From this point" (the southern town-enceinte) "another wall runs off, nearly at a right angle, which appears again by the roadside, about 115 paces to the westward, and, in a still more perfect state thirty paces further on. It is of very large stones, with *bevelled edges*, admirably put together, and of a style which resembles Greek masonry. Some of the blocks are 13 feet long and 2 high. I traced it in the same direction to the distance of 573 paces, or about 1,440 feet; and about 200 paces further on, is a line of rock resembling masonry, which may have been used as a continuation of the defences of the city. On the north side of the wall, the sarcophagus of the Albucii family was discovered, and other tombs are met with hereabouts. This wall may have been used to protect the entrance to the river and the port, or may have belonged to the older city, before the Romans came into Dalmatia, when Salona was already a place of importance; and the character of its masonry is the more remarkable, as it seems to point out a connection with the Greeks." The learned author also shows the importance of Salona by quoting Strabo (lib. vii. 5, § 5):

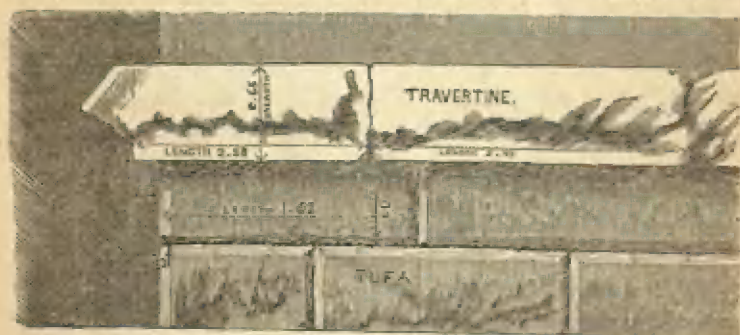
"Ἐπεὶτα . . . καὶ ἡ τῶν Δαλματῶν παραλία, καὶ τὸ ἐπινεῖον αὐτῶν Σάλων. Ἔστι δὲ τῶν πολὺν χρόνον πολεμησάντων πρὸς

* Dionysius Hal. (l. 28) relates on the authority of Myrillus that the wall which surrounded the City of Athens was called Pelagic.

*Ρωμαίους τὸ ἔθνος τοῦτο, κατοικίας δ' ἔσχευ ἀξιολόγους εἰς πεντήκοντα, ὧν τινὰς καὶ πόλεις Σάλωνά τε καὶ Πριάμωνα (Priamon ?), καὶ Νινίαν, καὶ Σινώτιον, τὸ τε νέον καὶ τὸ παλαιόν, ὡς ἐνέπρησεν ὁ Σεβαστός (Augustus).**

The highly distinguished Egyptologist, to whose literary kindness I am personally indebted, here showed his normal acumen. But "bevel" means properly rabbeting, or oblique rebatement; in fact, "the angle formed by two surfaces of a solid body, meeting at an angle which is neither a rectangle nor half a right angle." It is still a favourite with architects, but we must not apply the term to the masonry of Salona; the latter is chisel-dressed to a narrow flat draught or border, and a boss or projection, apparently of unusual height, and invariably forming a rectangle with the lower plane. By some writers on the Holy Land (*e.g.* Dr. Barclay, "City of the Great King," p. 494) it is made a characteristic of "Hebrew architecture," whatever that may be; and, probably because they observed it at the "wailing-place" of the Jews, they named it the "Jewish bevel," a compound misnomer, it being neither "Jewish" nor a "bevel." The "Chosen People," I need hardly say, borrowed all their architecture, and, indeed, art in general, from the polished Phœnicians, and even more distant races.

This variety of stone-dressing, so useful in the determination of style and date, appears hardly to have been studied with the attention which it merits. A distinguished English archaeologist at Rome informed me that he held it to be a classical



form originating in the early centuries after our era. How far wrong he was, may be judged from the foregoing sketch of the huge walls, which are generally, indeed universally, supposed

* "Then . . . the coast of the Dalmatae, and their naval arsenal, Salon. This nation was for a long time at war with the Romans" (alluding to the Illyrian wars). "They had fifty considerable settlements, some of which were in the same rank of cities as Salon, Priamon, Ninias, and the old and new Sinotium,

to be part of the Agger of Servius Tullius. I was honoured with the illustration and the following note by the discoverer, the Right Rev. Father Joseph Mullooly, the learned Prior of S. Clemente, whose "History of Excavations," and "Saint Clement and his Basilica in Rome" (1 vol. 8vo) are so highly valued:

"The breadth of the draught or border of the tufa stones is a little more than an inch each way, and the cavity or channel between them precisely three centimetres, which gives the height of the boss. The tufa blocks, which I discovered under the floor of the subterranean basilica are believed by Mr. Parker, C.B., to date from the early days of the Roman Monarchy, and the travertine from the Republican times."

The object of the "draught and boss" was evidently to relieve the jointing from the over-pressure of heavy bodies; hence we find the system variously adapted to a multitude of different forms by the latest, as well as by the earliest, builders. Some are exceedingly complicated. For instance, in the palace of King Hensius, at Bologna (Palazzo del Podestà, A.D. 1261-1485), each stone has a central rose upon a flat table, highly raised, and connected with the corners by four ribs, each from one of the sides of the square. (See fig.)

Perhaps the most popular is the bevel with rusticated boss; and I have noticed, both in England and in Syria, the raised draught and the sunken centre, a modification which clearly defeats its own purpose.



The learned Dr. Rosen, formerly Prussian Consul at Jerusalem, finds the following three distinct epochs of megalithic and "bevelled" (*i.e.* draughted and bossed) architecture in that most venerable part of the East:

1. The fine, rather wide, and shallow draught, often 6 inches in breadth around the edge, the whole stone carefully squared, and the boldly projecting boss finely cut and plain-dressed like the border. This he would call pre-Herodian, though there is no reason to think that the Israelitish cities had any peculiarities of architecture, and he instances the "Wailing Place," Arák el Amir, in Gilead (B.C. 290), and other well-known ruins.

2. The deeply-draughted edge, with the face of the stone projecting more boldly, and only rough-dressed with the hammer, or left as hewn from the quarry. He would consider this early Roman and Herodian, and he finds it in most of the antecrusading remains.

3. The latest type is the roughly-draughted border, with the

Augustus burnt them down." In Strabo, the Dalmatian coast, the coast of the Iapodes (Fiume), Liburnia (Northern Dalmatia), and the Liburnian Islands, especially the modern Lissa and Lesina, are given in due order.

whole face of the stone standing boldly out, but only hammer-dressed, or left as first quarried. This, he says, denotes the later Roman period.

The Rev. Mr. Tristram, a careless and superficial observer, speaks (p. 78, "The Land of Israel," London, 1866) of the "well-known *Jewish or Phœnician bevel*," and attributes (p. 80) to Dr. Rosen's first and earliest epoch the Haram of Hebron, which we have every reason to think is of far later date.

I would distribute the draughting and bossing (not bevelling) of the Syrian ruins into three epochs—the Phœnician,* the classic (Greek or Roman), and the modern, the latter being conspicuous in the khans or caravanserais. There are many local varieties; for instance, the double form in the church of Constantine and Helena at Yabrúd. Syrians, ancient and modern, work everything, from sewing to stone-dressing, in ways differing from, and often contrary to, Europeans. For instance, they begin to dress, not with the hammer, but with the pick, which with us comes much later.

The modern style of cutting stone in Dalmatia and Istria, which probably dates from the remotest days, may throw light upon the system of their classical predecessors. The ashlar is first dressed with the heavy square-headed *mazza* or metal hammer. It is then subjected to the *punta*, pointed, or narrow chisel, or to the finer *scalpello*, both used with the *mazziola*, or *maglio*, a heavy mallet of soft iron, in which the hollow can be filled up. The modern pavement of Trieste and other towns employs the *punta* when the sandstone blocks are laid in place. The next process is the application of the *brocca*, a triangular pick, with sharp apex and a toothed base. Then comes the *martello di denti grossi, medii (culgo, "il bastardo") e fini*, the latter called *doppia martellina*, because the teeth are double in number; for instance, one head will have sixteen, and the opposite eight. The French *boucharde* with diamond-shaped steel points, worked with the *masse*, and the Italian *bocciarda*, useful in treating granite and hard stones, is common at Vienna, but not used at Trieste or in Dalmatia. Finally, the stone, finished with the finer *scalpello* of many forms, even dentated, is polished with common sand or *saldame* (Molla or Sasso Marzo), a fine powder of *silex* found in the limestone strata, and not easily accounted for.†

* From the Phœnicians came the Etruscan boss, which is found at the ruins of Mignano, near Bologna, to mention no other place.

† These pockets, full of fine *silex*, are mysterious formations, to which Linnaeus (Syst. Nat. "Silex") alludes, "*Silex nascitur in montium cretaceorum rimis, uti quartrum in rimis saxorum.*" We find them at Prosecco and Reppen Tabor, near Trieste, where the colour is dark, and near Pola, whose ruddy or straw-tinted sand has been extensively used for Venetian glass. The same anomaly occurs in volcanic Iceland, whose *silex* beds near Cape Reykjanes (the south-western ex-

If a *spigolo* (list), or a *listello* (draught), be required, it is worked with the *martello* rather than the *scalpello*, and the *rustica* is left simply random-tooled or hammer-dressed, not grooved nor pitted into holes (prison rustic). La Bugna (*pietre bugnate*) is the term applied indifferently to "frosted stones," to the bevel, or to the boss and draught.

Amongst Dalmatian writers, the only authority who has treated the "Murazzo" of Salona as it deserves is the well-known Abate Carrara ("Topografia e Scavi di Salona," del Dr. Francesco Carrara, Trieste, 1850). In the first (topographical) part of his learned little volume, he mentions it only once (p. 63); in the second portion, or history of the excavations, he refers to it three times. The first (p. 128) is in connection with the classical cemetery enclosed by it, and by a wall of large white (limestone) blocks, carefully squared, running parallel with it to the north, and distant 3 Viennese tese (fathoms—each 6 Austrian feet=6 feet 2 inches '67). In p. 147, he tells us that between 1847-8 were opened "ottocento klafter (the same fathom) di muro ciclopico di epoca antiromana;" and in pp. 136-9 he describes it in these words:—

"All' ovest della città antica si mostravano gli avanzi di un muro a grossi massi squadrati della quarta epoca delle costruzioni ciclopiche (courses of various sizes, but always rectangular). Il quale continuava interrottamente per quasi 130 tese, *senza mostrare nè cominciamento nè fine*. Tra per la curiosità di determinare l'estesa e la direzione di quel muro, non meno che la sua relazione col perimetro dell' antica città, e con ciò soddisfare ad un importante curiosità nostra, ed al desiderio del dotto viaggiatore Scozzese, A. A. Paton ('Allgemeine Zeitung,' Adriatische Briefe vii. Salona, num. 141, 1846); e tra pel desiderio di cercare la lunghezza della necropoli scoperta a fianco della via maggiore, condussi a termine, mediante tasteggiamenti, uno scavo importante. Dal quale rilevo che il muro ciclopico segnato nel mio piano a linea grossa interrotta, lungo più di 800 tese, partendo dalla cinta a ponente del perimetro antico, corre, pressochè in linea parallela alla strada regia, attraversando il torrente Slano, e continuando sino a quello di Blandiste, che marca il confine tra Salona e Castel Suguraz. Di là, anzichè avanzare al disopra della strada, risalta al Sud, riescendo con dolce deviazione dalla prima linea fino alla località detta Stagun ove termina con due mausolei.
 La misura media de' massi che formano il muro ciclopico dà in altezza 2' 3" (Viennese feet 100=103.71 English),

tremity), a purely eruptive country, have been spasmodically worked. Pliny (xxvi. 6) declares that the Roman workmen used a sand found in the bed of the Adriatic when the waters retired. Fortis (ii. 271) noticed this Saldamo at Loparo (Neo-paros?) in the Island of Arbe.

in larghezza 2' 6"; in lunghezza 10'; il muro non è più grosso della grossezza dei massi.

" Codesto muro ciclopico fiancheggia la strada antica romana sopra la quale i francesi, per ordine de Marmont, aprirono nel 1808 la strada regia attuale. La deviazione che ho notata di esso muro della strada regia al torrente Blandiste, si spiega con ciò, che i francesi, arrivati a quel punto, piuttosto che progredire sulla linea della via antica, rifecero la direzione della strada per farla più mediterranea lungo la bellissima riviera delle Castella. Ciò nulladimeno, dalle osservazioni fatte in tanti anni a Salona, vedo costantemente che ogni strada e viuzza attuale corre sopra le rovine di una via o di un clivo romano.

" Dal muro ciclopico preesistente a Salona romana, trassero partito i Signori del mondo per istabilirlo a linea di divisione fra la via pubblica e la maggiore necropoli. E difatti, dal punto in cui il muro si stacca dal recinto di Salona, sino a che si perde nel torrente Blandiste, al nord di esso, trovasi il cimitero antico, al sud la strada; da Blandiste a Stagun la necropoli si presenta al sud, la strada al nord. Il quale mutamento di disposizione risultante da moltissimi tasteggiamenti da me fatti (a tutto giugno dal recinto all' ovest di Salona sino ai mausolei che seguano il termine scoperto del muro ciclopico si mostravano più di 300 buchi non minori in superficie di una tesa quadrata, profondi dai 4 a 12 piedi), si spiega di leggieri dal contraste che offrono le due linee di muro toccanti al torrente Blandiste. Del resto per determinare l'uffizio di quel muro converrebbe continuare l'opera incominciata nel quarantotto, e per lo meno con ispessi tasteggiamenti cercarne l'ulteriore andamento. S'arriverebbe forse a conoscerla, come è verosimile, quale muro di precinzione di Salona antiromana, che è quanto dire dell' antica Salona."

In p. 139 we read, " Ora nel discoprimiento de più che 800° (fathoms) del muro ciclopico, hassi un mezzo di comprendere la causa del fallo, e scusare taluno di que' grossissimi errori " (alluding to the discrepancies of shape and measurements found in former descriptions of Salona). Page 157 notes that the Roman theatre has a " muratura a bugnato," which, I have said, applies equally to the bevel and to the draught and boss, the latter being here meant; but no notice is taken of the same work in the Cyclopean wall, which is far more remarkable and characteristic. Moreover, when stating that the " Murazzo " shows neither beginning nor end, the learned Abate had not noticed the highly interesting eastern prolongation which extends nearly to the new town.

The accompanying plan of Salona (Pl. xii.) shows by numerals the position of the pre-Roman wall. It begins (H) at the junction of the two enceintes, the " linea di congiungimento de' due peri-

metri Romano-Salonitani" (Carrara), and near where the learned Abbé places his "Porta Suburbia." The stones, at once distinguished by their size and by their blue-grey tint, the *argilla marina plumbata* of old authors, are much degraded. Thence it runs from magnetic SSE. to NNW., roughly speaking: beyond the amphitheatre forming the north-western angle, it has been totally destroyed; but farther along the path, the line bends at nearly a right angle to the south-west, till it abuts upon the modern Strada Postale, or Regia of Spalato-Traù.* Here also the soft material has been seriously injured by time and weather. Beyond this point it resumes nearly its original direction (SSE.--NNW.), and, passing the place marked in the plan "Scavi di, 1824," Orto di Metrodoro, it is in tolerable preservation. At the angle where the Strada Postale bends suddenly almost to north, a natural reef-ridge of large limestone blocks, standing up like a wall, prolongs the "Murazzo," with a slight deflection, to the sea-shore. I saw no traces of work on this feature, and, although draughted and bossed stones are said to have been found along the eastern side of the French highway, I could not detect them.

The accompanying rough sketch from my diary shows the position and the dimensions of the three courses of masonry where the wall is best preserved. I was assisted in the work by M. Aristide Vigneau, of Spalato, and I have been promised a photograph of this highly interesting section.

| | | |
|------------------------|---------------|------------------|
| Height of highest tier | . 0.61 metres | } 2 ft. English. |
| Height of middle tier | . 0.61 metres | |
| Height of lowest tier | . 0.18 metres | |
| | | 7 inches „ |

The latter buried in gutter of roadside.

Mostly blackberry bushes.



"Murazzo" (Long Wall) of Salona, facing SSW.

The lowest stratum is almost concealed by the north-eastern side-drain of the Strada Postale. The reverse flank is completely buried, and the bushes projecting over the top spring

* The well known *Tragurium* of the Romans, which Const. Porphyrogenitus (*De Administr. Imperii*, cap. xxxvi.) writes *Tetragurium*; we find "*Cum tota Travia*" in a document dating from A.D. 1400 (Bogčić, p. 91); the modern form is *Trogir* (Slav) and *Traù* (Ital.), which Wilkinson writes, without reason, *Traù*.

from a cornfield. The sooner excavations are here made the better.

This "Murazzo," to use the Venetian term, cannot be considered a sea-wall, nor is it the defence of the more modern Roman city—the two favourite conjectures. The shore line is wavy, and its distance from the masonry ranges between a minimum of 50 and a maximum of 220 metres. The Strada Regia follows very nearly the ancient line, as the discovery of a milliary column proved, and the following facts show that it was like the Via Appia and the Roman entrance to Palmyra,* a favourite site for cremation and interment, ash urns being found on one side and tombs on the other. North of the wall is the well-known Roman necropolis, where a number of sarcophagi, based either upon stone pavements or upon the naked earth, are still seen. They had been rifled and injured, probably about the time of the Hijrah, by the Avaro-Slav invader (circa A.D. 639), before his expulsion by the Croat. On the other side again (south), at the place marked "Scavi, 1824, Dolj Sepulerali," a curious amphora-shaped dolium, with narrow neck, was found horizontally cut for the admission of a human body. It is figured by Dr. Lanza ("Monumenti Salonitani inediti"), but I could not procure a copy, the book having long been out of print. Here many sepulchral urns with ashes, and mostly inviolate, unlike the more exposed sarcophagi, have been unburied. We may, therefore, conclude that this part was the Ustrinum, Ustrina† or burning-ground, the Smáshan of the modern Hindus.

It is not a little curious that no less than nine jars containing bodies have been found when excavating the cities and cemeteries of Etruria Circumpadana, near Bologna. The Bolognese amphoræ which contained the remains were either full length—that is, pointed at the base—or half-sized, with flat bottoms, and in all cases the skull was found upwards or near the mouth. The reverse was the system of the Brazilian Tupi-Guaranis, and I have suggested ("Notes to Hans Stade," i. 125) that the idea arose from their desire of returning the body to the position in which it was originally formed. In all cases which came under my notice the head was placed downwards, as if in the womb,

* From Palmyra we may judge that the practice, at once hygienic and æsthetic, passed over to Etruria, from which it was borrowed by the Romans. The Etruscan cosmogony, which puzzled antiquaries by its curious resemblance with that of Genesis, has, at length, been explained by the discoveries of Mr. George Smith at Koyunjik. The Chaldean story of the Creation and Fall of Man proves that the Genesitic mythos attributed to Moses extended throughout the nearer East from Egypt to Assyria, and hence it was evidently transported by the Etruscans to Italy.

† The Ustrinum differs from the *τύφος* or Bustum; in the former the corpse was burnt; in the latter it was also buried.

although M. Adolfo de Varnhagen ("Historia Geral do Brazil," Pl. opp. p. 112) gives an illustration with the feet downwards.

That the "Murazzo" is not Roman is proved by its remarkable contrast with the more modern epoch. The material is everywhere a calcareous eocenic marl, a transition from limestone to sandstone, blue-grey, and easily degraded, the *marne* of the Mons Caprarius, which forms the lofty background of Salona. All the Roman city is built of the calcaire (nummulitic,* hippuritic, &c.) of the same period, quarried from the backbone of Dalmatia, the eastern fork of the Apennines. This, in fact, is the normal rock bounding the Mediterranean sea-board. The material of Diocletian's palace was quarried in the island of Brazza, once doubtless terra firma, and the port at which it was embarked is still known to the people as Spliska, Spljet being the Slav equivalent for Spalato or Aspalathus.† Again, the length of the sandstone blocks which we measured, varies from a minimum of 0·90 (2 feet 11 inches) to a maximum of 2·76 metres (8 feet 2 inches); the depth of the highest and middle courses is 0·61 (2 feet), and the third shows only 0·18 (7 inches). The width of the draught ranges between 6 and 16 centimetres (2·40 inches to 6·40 inches), and the bold boss may have originally risen as high as 8 inches. In the Roman theatre (P) the stones are also draughted and bossed, but the largest gave a length of 1·11 metres (3 feet 7 inches), with a draught varying in width from 31 to 87 millimetres (1 inch to 4 inches the maximum), and the projection of the boss was insignificant. The same stone-dressing will be found in the Temple of Esculapius at Spalato—a name traditionally given without a shadow of reason, and in the "Duomo" (*domus* or cathedral) of S. Doime, attributed to Jupiter, apparently because Diocletian assumed the title of Jovius; or to Diana, because the frieze shows hunting and other rural subjects; but in both cases the draught is narrow, little exceeding an inch.

Two distinct origins have been proposed by local antiquaries for this interesting feature, and both agree, with Wilkinson, in attributing it to the Greeks.

P. Farlati (Illyr. Sacr., i. 272) and Carrara (*loc. cit.*) find it

* These nummulites mark the *début* of the Tertiary epoch, and the hippurites are so common in Istria that they have been called the Istrian formation.

† Const. Porphyro. gives Aspalathos (chap. xxvi.) amongst the coast cities held by the Dalmato-Romans. In the fifth century (temp. Arcadius Notit. dignitat. utriusque Imperii. caps. ix. x., quoted by Lanza, p. 23, Dell' Antico Palazzo, &c.), we read of the "Procurator Gynæcii Jovensis Dalmatiæ Aspalato." According to Lanza, the "urbicola," rebuilt after the Avar invasion of the seventh century, was first called Aspalathum, then Spalatum, and lastly Spalato, not Spalatro, as the learned Fortis has it. Mr. G. P. R. James, the novelist, speaks of the "little village of Aspalathus" in the days of Attila; he also terms Salona a "small *but* prosperous town"—the "but" is charming.

in Apollonius Rhodius (B.C. 250). That poet (iv. 336—563 *et seq.*) makes, in his "Argonautica," the Colchi, led by Absyrtus, who accompanied, or who was sent by, his father Æetes, in pursuit of his sister Medea, occupy the island in which he was slain. This is generally supposed to be Osero, or Ossero, near Cherso (Kherso)* in the Sinus Flanaticus (hod. Quarnero, or Gulf of Fiume, and its section between Cherso and Arbe the Quarnerolo). The earlier name was "Ἀψυρος, Ἀψυρος, or Ἀψοῖρος; and the neighbouring "Ἀψυρτεῖς, Ausyrtides, or Absyrtides (cf. Strabo vii. 5, vol. i. p. 484, Bohn) as far as the Nestus (Tilurus) river of Cettina,† not to be confounded with the Nestus of Epirus (hod. Mesta or Kara-sú), a coast wholly wanting islands. After occupying "*usque ad Salangonem* (Salona?) *fluvium, Mestidaque terram*" (Carrara), they moved off to Issa (Lissa) to Kerkyra Nigra (Κέρκυρα μέλαινα, mod. Curzola) and Melite (Meleda). In lib. 4, l. 524 (Merkel's Edit. Leipsig, 1854) we find mention of 'Ταλῆς, and in line 535—

Ἀμφὶ πόλιν Ἀγανὴν Ἰαλλίδαν

"where some read Ἀγανὴν, and others, μεγάλην," the greatest of the fifteen cities of Scymnus Chius (407), and possibly hence the corruption Salangon, twice referred to by Carrara (pp. 1-4). In lines 562-3 we have

Ἄλλ' ἔθεον γαίης Ἰαλλίδος ἑξανιόντες
Τηλόθι

And this Hylleis is supposed to have been colonised by Hyllus, son of Hercules (B.C. 1230), father of the 'Ταλῆς or 'Ταλλεῖοι

The learned Abbé adds that if the Siculo-Issani (of modern Lissa) built, as we know they did, Epetium (mod. Stobrez) and Tragurium, afterwards the "*oppidum Romanorum marmore notum*" (hod. Traù), they would hardly have neglected the admirable position of Salona, which lies between the two, and

* The Abbé Fortis, "Saggio d'Osservazione sopra l'Isole di Cherso ed Osero," Venice, 1771 (pp. 1-12), treats this subject with abundant erudition. I fail to see the reason why a barque, manned by about 50 men, should not have coasted along the Black Sea, have ascended the Danube, and even have been portaged to the Istrian coast. Yet the "Myth of the Argonauts" is a favourite thesis for German nebulousity, and the last treatment was administered by Dr. A. Kuhn ("Über Entwickelungstufen der Mythenbildung," Berlin, 1874).

† "Nestus (alii Nestos) urbs et fluvius Illyrii hinc Nestus," says Steph. Byzant, quoted by Giovanni Lovrich, "Osservazioni sopra diversi pezzi del Viaggio in Dalmazia del Sig. Ab. Alberto Fortis," &c., Venezia, 1776. He is a severe critic who chooses for his motto, "His que narrata sunt non debemus cito credere; multi ementiantur ut decipiant, multi quis decepti sunt" (Sen. de ira); and "Credat Judeus Apella" is a favourite exclamation. The learned Abate's book was so famous that it could not fail to find its Zoilus.

which is far superior to both. Moreover, he assures us that Illina is the name still locally given to the ground lying west of the oldest Salonitan gateway, the Porta Cesarea; and that Illino-vrilo (Hyllus-fount) is the peasants' name for the spring between the chapels of SS. Cajo and Doimo at the foot of Mons Caprarius.

On the other hand, the Herakleia of Scylax Caryandensis is proposed by other antiquaries, especially by Professor Francesco Dr. Lanza di Casalanza,* a highly distinguished geologist,

* The following is a detailed list of Professor Lanza's meritorious works:—

1. "In Cyanuretum rubium, inquisitiones chemico-pharmacologicae." Ticini Regii, 1831. Vol. i. in 8vo.
2. "Sopra le Terme dell' antica Salona." (V. *Bullettino dell' Istituto di corrispondenza archeologica*. Roma, 1837, pag. 131).
3. "Relazione nosografica statistica sull' epidemia colerosa che invase la Dalmazia nell' anno 1836, corredata di osservazioni pratiche specialie generali, aggiuntavi la descrizione dell' Aretermo inventato dall' Autore, per la immediata applicazione del calore all' esterno." Trieste, 1838, un opus in 8vo, con una tavola.
4. "Saggio storico-statistico medico sopra l'antica Narona e lo stato presente del suo territorio, corredata di una carta topografica." Bologna, 1842, vol. i. in 8vo.
5. "Doveroso tributo di un figlio." Torino, 1846, un op. in 8vo.
6. "Dell' Mausoleo dell' Imperatore Diocleziano in Spalato: Lettera all' illustre Sig. Car. Geo. Dr. Labus, Spalato, 1 Agosto, 1846. (V. *Giorn. La Dalmazia*, 1846, n. 52).
7. "Ancora pochi cenni sul Mausoleo di Diocleziano." (V. *Giornale, La Dalmazia*, 1847, n. 14).
8. "Confutazione alla illustrazione del supposto sepolcro di Diocleziano e vera interpretazione dei bassirilievi che vi si trovano scolpiti." (V. *La Dalmazia*, 1847, n. 48-49).
9. "Le Bocche di Cattaro, descritte ed accompagnate da vari costumi." (V. "il Mondo illustrato," di Torino, ed il *Giorn. La Dalmazia*, del 1847.)
10. "Il Montenero." (V. *Enciclopedia popolare di Torino*.)
11. "Dell' Isola Lesina." (V. *Encic. pop. di Torino*.)
12. "Dell' Isola Lessa." (V. *Encic. pop. di Torino*.)
13. "Narenta." (V. *Encic. pop. di Torino*.)
14. "Dello stato economico di Castilnuovo nel Circolo di Cattaro." (V. *Gior., La Dalmazia*, 1847.)
15. "Sugli attuali bisogni della Dalmazia: Lettera ad un amico." (V. *La Dalmazia costituzionale*, 1848, li. 16.)
16. "Delle condizioni presenti dell' Austria: paroli di un dalmato." (Art. pub. nel *Giornale La Dalmazia costituzionale* e reprodotta nel *Giorn. del Lloyd Austriaco*, del 1848, n. 173).
17. "Delle cognizioni di chimica indispensabili alla scienza agraria." (V. *Gazzetta di Zara*, 1848, n. 11, 12.)
18. "Metodo efficacissimo per la guarigione di ferite d'arma da fuoco agli arti complicati a fratture delle ossa per cui può risparmiarsene l'amputazione." (Art. pub. dall' *Ecc. Governo del Litorale Aust.* in *Giugno*, 1848, e diramato al personale sanitario dell' armata Austriaca.)
19. "Antiche lapidi salonitane inedite illustrate." (Spalato, 1848, e 2da ediz. Zara, 1850, un vol. in 8vo.)
20. "Sulla importanza della storia naturale e della economia rurale: Discorso inaugurale, Zara, 1849, un op. in 8vo.
21. "Della Topografia dell' antica Salona, con una carta topografica." (V. *Annali dell' Istituto di corrisp. Archeol.*, Roma, 1849.)
22. "Rapporto generale degli Scavi di Salona, dalla loro prima istituzione sino al giorno d'oggi." (V. *Annali dell' Instit. di corrisp. Archeol.*, Roma, 1850.)

numismatist, and antiquary, who has travelled in England, and who has written his travels. He kindly gave me a copy of his useful study "*Dell' antico Palazzo di Diocleziano in Spalato*," &c., &c. (Trieste Tip. del Lloyd Austriaco, 1855), in which he has made sundry corrections of Adams' the architect's classical folio, "*The Palace of Diocletian*," and of his "*Antiche lapidi Salonitane inedite illustrate*." In this volume the inscriptions are translated, not merely copied, after the lazy fashion of many authors, and the learned writer has freely acknowledged the assistance of the celebrated Abate and Professor Furlanetto, and of his distinguished father, the late Carlo Lanza, a surgeon in the French army of occupation. I can only express a hope that his manuscript, "*Discorsi critici sulle antiche Storie degli Illirici, dei Dalmati e dei Liburni*," may soon see the light; and that the learned author will republish, for the benefit of travellers, his valuable essay, entitled "*Monumenti Salonitani inediti*," printed in its Transactions by the I. R. Academy of Sciences, Vienna, and in a separate form, also at Vienna, 1856.

We find the only notice of Illyrian Herakleia in the *Periplus* attributed to Scylax Caryandensis, and written—such is the difference of commentators—between the middle of the fourth century B.C. and the third and fourth centuries A.D. (Müller). P. Farlati has charged the Greek author with inac-

23. "Poche parole ancora sul colera, e specialmente degli insetti che furono osservati generarsi nei cadaveri dei colerosi." (*D. Gazzetta di Zara*, 1849, n. 124.)

24. "Sulle opinioni riguardo alla contagiosità del colera: Lettera al Sig. Redattore dell' *Osservatore Dalmato*." (*V. Osservat. Dalmato*, 1849, n. 131.)

25. "Sulla Topografia e scavi di Salona dell' Ab. F. Carrara Confutazione." Trieste, 1850, un opusc. in 8vo.

26. "L' *Agronomo raccogliitore*; Giornale ebdomadario di economico rurale." Zara, 1850.

27. "Elementi di Mineralogia basati sui nuovi principi di cristallografia e di chimica, ad accerupagnati da pratiche applicazioni economiche industriali con molte figure intercalate nel testo." Trieste, 1852, un vol. in 8vo.

28. "Di alcune ricerche geognostiche sulle formazioni dei dintorni di Zara." (*V. Programme dell' I. R. Ginnasio Superiore di Stato in Zara*, 1851-1852.)

29. "Nuove ricerche sulla formazione geognostica della Dalmazia: Rapporto rassegnato all' I. R. Direzione dell' Istituto Geologico dell' impero in Vienna." (*V. Il Collettore dell' Adige Verona*, 1853, n. 4.)

30. "Elementi di Zoologia ad uso degli I. R. Ginnasij e delle scuole Reali Austro-Italiane," 2nd ediz. Vienna appresso Gerold, 1855, un vol. in 8vo, con molte figure intercalate nel testo.

31. "Dell' antico palazzo di Diocleziano in Spalato." Illustrazione con 12 Tav. orig. Trieste, 1855, un vol. in 4to.

32. "Monumenti Salonitani, inediti illustrati," con 10 tavole originali. Vienna (per cura ed a spese, dell' I. R. Accademia delle Scienze.)

33. "Sur les formations géognostiques de la Dalmatie: memoria pubblicata nel Bulletin de la Société Géologique de France, nel f. di Dicembre, 1855, con una tavola litografata."

(For publication.)

34. "Discorsi critici sulle antiche storie degli Illirici, dei Dalmati e dei Liburni," un vol. in 8vo.

curacy concerning the Narenta, but he is fully rehabilitated, on this point at least, by the Abbé Fortis (ii. 152, Fr. ii. 208). As the passage of Scylax, though evidently corrupted, and in places, with its "lacunæ et interpolationes," almost unintelligible, is of the highest importance, it will be advisable to quote it at full length (cap. xxii. p. 28, "Geog. Græci min." C. Müller, Paris, 1860).

ΙΛΛΥΡΙΟΙ. Μετὰ δὲ Λιβυρνοὺς εἰσιν Ἰλλυριοὶ ἔθνος, καὶ παροικοῦσιν οἱ Ἰλλυριοὶ παρὰ θάλατταν μέχρι Χαιονίας τῆς κατὰ Κέρκυραν τὴν Ἀλκινόου νῆσον. Καὶ πόλις ἐστὶν Ἑλληνὶς ἐνταῦθα, ἥ ὄνομα Ἡράκλεια, καὶ λιμὴν. Εἰσὶ δὲ καὶ οἱ λωτοφάγοι καλούμενοι Βάρβαροι οἱ δὲ Ἱεραστάμναι, Βουλῖνοι (Ἰλλῖνοι ?). Βουλῖνων ὁμοτέρμονες ἄλλοι. Οὗτοι δὲ φασιν ἄλλον τὸν Ἡρακλέους αὐτοὺς κατοικίσαι· εἰσὶ δὲ Βάρβαροι. Κατοικοῦσι δὲ Χερρόνησον ὀλίγω ἐλάσσω τῆς Πελοποννήσου. Ἀπὸ δὲ Χερρόνησον παραστάνιον ὀρθόν [ear. lect. Ἀπὸ δὲ Χερρόνησου (Σίτσα νῆσος) παρα (τείνει) ὥς ταινίον ὀρθον ?] τάντην παροικοῦσι Βουλῖνοι. Βουλῖνοι δ' εἰσιν ἔθνος Ἰλλυρικόν. Παράπλους δ' ἐστὶ τῆς Βουλῖνων χώρας ἡμέρας μακρὰς ἐπὶ Νέστον ποταμόν.

Müller offers the following Latinisation:—

"22. ILLYRII. Post Liburnos sequitur Illyriorum gens, habitant que Illyrii secundum mare usque ad Chaoniam, que est ex adverso Coreyræ, Aleonoi insulæ. Est que ibi urbs Græca, cui nomen Heraclea, cum portu. Sunt ibi etiam lotophagi qui vocantur Barbari hi: Hierostamnæ, Bulini (Hyllini ?); Bulinorum vicini Hylli. Hi Hyllum Herculis filium sedes ipsis assignasse ferunt; sunt autem barbari, incolentes peninsulam paullo minorem Peloponneso. Post peninsulam vero (insula ?) oræ prætenditur quasi tænia recta; juxta quam accolunt Bulini [Holstenius "Post Chersonesum litus directum accolunt Bulini"]. Bulini autem sunt gens Illyriorum. Præternavigatio regionis Bulinorum usque ad flumen Nestum est longi diei unius."

Of Coreyra (*Κέρκυρα μέλαινα*) we have no doubt. As regards Heracleia, the theory of Müller is that the city's name found its way into the text as a mere gloss to the words Ἰλλων τὸν Ἡρακλέους αὐτοὺς κατοικίσαι. It has long been suggested, and with much probability, that the Ἱεραστάμναι is a corruption of Ἱαδερατήναι, the people dwelling upon the river of Salona, so well known by Lucan's oft-quoted couplet (iv. 404):—

Qua maris Adriaci longas ferit unda Salonas
Et tepidum in molles Zephyros excurrit Iader.

The name of the streamlet is also written Hyader, Jader, and Ider, the latter in the fifth century by Vibius Sequester (glossary): Pliny and the Anonymus Ravennæ prefer Salon; and the Acts of S. Domnius Salonus; whilst Carrara (p. 1) believes it to

have derived its name from the city. Similarly, according to Lovrich ("Osservazioni," p. 11) the Rumin, Buda, and Grab streams, took their names from the villages through which they flowed. This writer would make Nastos, or Nastus, an Illyrian word, Na-sto (above a hundred), corresponding with Cettina, alias Zentina or Zentena, because it was the chief of a *hundred* castles or cities.

Of the words *Βουλινοί* and *Ἰλλυνοί*, Müller remarks, apparently without sufficient reason, "ejice vocem natam ex ditto-graphia nominis precedentis." The Bulini are the *Βουλιμεῖς* of Dionysius Periegetes (387), who makes them contermini of the Hyllic Region, and Eustathius explains that these "Boulimeis" are also called *Βουλινεῖς* or *Βουλινοὺς*. In the anonymous poet vulgarly called Seymnus Chius (B.C. 92, if he be so old?), we find, 404—

Τούτοις (Pelagones et Liburni) συνάπτον δ' ἐστὶ Βουλινῶν ἔθνος.

The learned historian Lucius (Giovanni Lucio), of Traù, would place the Bulini about the present village of Bossiglina, commonly pronounced Bussiglina, an old fief of the Bishops of Traù, famous for fleeces. It is mentioned by Fortis as a pauper settlement, where the people cooked and ate arum, asphodel, and juniper berries.*

We now approach the most debated part of the passage. Seymnus Chius (405) mentions the *Μεγάλη Χερρόνησος Ἰλλική*, believed equal (in extent) to the Peloponnesus, and containing fifteen cities inhabited by the Hyllæi. These people are described as *Κελτικὸν ἔθνος* (Etym. M. pp. 776, 39) and as Pelasgi by Niebuhr (R. G. i. 53). Pliny also (iii. 26) gives the Peninsula "Hyllis" a circumference of c. M. paces.

Lucius of Traù, would confine the great Hyllic Peninsula to the lozenge-shaped, rocky-tongue of land projecting from Mossor, and bounded north by the Iader, and south by the Xarnovizza (the stream of the Xarn or mill), the latter unknown to the classics. This spear-head divides the little bay of Spalato from the long gulf of Salona, and its bold apex is the Promontorium Diomedis, perhaps the later Fanum Dianæ, a western projection of Monte Mariano, not "Marglian," so given by Wilkinson (i. 113). As Fortis very justly remarks (ii. 4, Fr. ii. 5 and 6) the Greek author must not be credited with the blunder of comparing with the Morea a slip of land, a triangle

* The shrub grows wild all over the limestone formations of Istria and Dalmatia. In the remoter parts, a wine is made from the fermented berries, and the fresh fruit is used in medicine. A favourite prescription against rickets in children is to pound to a paste in a stone mortar the freshly-gathered berries, to mix with an equal part of fresh butter, and to apply this pomade to the articulations and the parts affected, every night and morning before the child rises.

only 12 miles long by 5 of maximum depth, between the Islet of Rogosnizza and the Bossiglina village. The learned Abbé would, therefore, identify the Hyllie Chersonesus with the rich riverine peninsula from the mouth of the Titius of Pliny (iii. 24), the Titus of Ptolemy (*Τίτου ποταμοῦ ἐκβολαί*, ii. 17, § 3), now the Kerka of Sibenico, and the Tilurus, the modern Cettina or River of Almissa. This tract contains the "belle campagne" of Kniv, of Petrovopolje, and of Cettina or Sign, and the site of Promona, the chief Illyrian settlement in the days of Augustus. This tract, he justly says, is still able to support a score of cities. At the same time, he objects to the theory which would find "Hyllis" in the rocky tongue of Sabbioncello, which is distinctly alluded to by Scylax (cap. 23).

Finally, we are tolerably sure about the Nestus river and its accolae, the Nesti. The stream cannot be the Titius or Kerka, because the course of the Periplus is evidently southwards to the Naron, which it names; the latter is clearly the Narenta, or river of Mostar (old bridge) with its "island 120 stadia in circumference," still represented by the site of Fort Opus. Nothing, therefore, remains for it but to be the Tilurus or Cettina. Fortis holds the Nestians to be the people of the modern Primorje and the riverines of Cettina. This coast, fronting Brazza, Lesina, and Sabbioncello, was called, in the middle ages, Parathalassia, which the Slavs translated by the synonymous Primorje (along-sea). In the days of the Avar invasion it took the name of Paganía, from the Poganin or pagan Illyrico-Serbs who tenanted it; and, subsequently, the Arch-deacon of Spalato, Giovanni Tomaso (in Lucio di Traù),* preserved the barbarous "Maronia," also a synonym of Primorje.

Prof. Lanza would place the Nestoi in the highlands of Pogliza or Poglizza; the ghats north of Dalmatia Proper, extending from Olissa Fort (Spalato) to Duare Town, or between the debouchures of the Xarnovizza and the Cettina streams. The name of this rugged oak-clad country, which has not, and, probably, never had a city, is by no means unknown to modern history; and its annals are so curious that I am tempted to a digression. According to Fortis (ii. 92, Fr. ii. 124-128), who ably sketches the picture of the last century, this little aristocratic republic, never containing more than 15,000 souls, freed itself from the Porte, and, like its sister, Makarska, in A.D. 1646, threw itself into the arms of the "Serenissimo Governo," (Venice).

* Thomas (nat. A.D. 1200, ob. 1268) wrote the "*Historia Salonitanorum Pontificum atque Spalatensium*." Joannes Lucius has left us the valuable "*History de Regn. Dalm. et Croatiae*." He died at Rome in 1679, and his valuable MSS. are supposed to have been neglected.

Society was divided into three classes, which suggest the Sixties and Four-candles, the Forties and the Twenties of aristocratic Guernsey. The first consisted of 20 noble Hungarian families, whom troubles had compelled to emigrate; the second were Bosniac (Christian)* nobles; and the peasantry represented the third. On the Fête of St. George† (Greek, April 19; Latin, April 23), an annual Zbor, Diet, or Assembly met on the plain of Gatta for the election or re-election of magistrates, each company camping apart. The Veliki-knès (Knjaz, or Knight), the "Great Count" of Fortis, was always a Hungarian; the electors or little counts, Bosniac nobles, represented the village communities which they governed. Whilst the Governor was being chosen, the plebs held their comitia to elect the local chiefs for the next year, or to confirm those who deserved the honour. The "First Order" chose a captain and two procurators to supervise the voting, and election riots were common; whilst the "voto segreto" or "scrutin" was proceeding, some zealous partisan would seize the box containing the provincial privileges (*cassetta de 'Privilegi del Paese*), which the law committed to the keeping of the Great Count, and run away with it to the house of his favourite candidate, in which case the latter became "*bello ed eletto*." The difficulty of this proceeding was that all the electors might shoot at him, chase him with their khanjars (long Turkish daggers), or throw stones, in which exercise they are proficient, like the Syrians. The laws of the Poglizani preserved the rudeness of the ages from which they date. In cases of land disputes, the judge repaired to the spot, sat upon a cloak or rug to hear the pleadings, and pronounced a decision, from which, usually, there was no appeal. After a murder, the local court or governor and his notables went to the criminal's abode, and ate and drank him out of "house and home"—a form of "dragooning" well-known to all Easterns—and, finally, the Great Count and his comity pillaged all that remained. Formerly assassins were stoned, and this patriarchal custom long endured in the modification which bears the name of Judge Lynch. For simple

* Many Dalmatian families derive themselves, truly or falsely, from the nobles of Bosnia, as we do from the Normans. Lovrich (p. 213) shows the difficulty of genealogy by the system of taking the father's name as surname; e.g. Philip, the son of Mark, would be Marcovich. He shows us the gradual growth of family names. "Quanto meglio la intendono i Dalmatini di oggi giorno (parlo di quelli, che non si vergognano del cognome Slavo, e che non lo Italianizzano) a non mutar cognomi da padri in figli, ma quello che lasciano i padri, tramandano ai figli, ed ai nipoti."

† An Illyrian proverb, cited by Lovrich (p. 78) is "*Jurev danski Hajduki mastanski*:" "George's Day; bandits array," because at that time the woods became leafy enough for ambushes. If it rain on St. George's Day, cereals will be abundant.

manslaughter, unaccompanied by atrocity, the "platiti kervarínu" (lit. blood spilt),* or blood-money, the *Diyat* of Moslem law was fixed at "quaranta tolleri," \$40 or 8 zecchini (each = flor. 4.75—5). The object of the fine was to prevent the criminal appealing from the decision of the Great Count to the Venetian *Provveditore Generale* of Dalmatia.

Those remnants of the blood-and-iron ages, ordeal by fire and boiling water, were common, and bore the usual results, injuring and even permanently maiming the innocent, and allowing the sturdy ruffian to escape punishment. One form was worthy of Persia in the last generation: splints were thrust under the finger-nails; the material was always the "sapino" (*Pinus maritimus*),† because specified in the statutes, and the people would tolerate no innovation.

The Poglizzan Morlaks were a robust and well-made race, and Fortis gives them a good character, despite the patriarchal barbarity of their code. Sober and hardworking, they could boast—

*Durum a stirpe genus, natos ad flumina primum,
Deferimus, sævoque gelu duramus et undis.*

They made a practice of bathing the babes in icy streams. These Morlaks were, and are, excellent irregular troops, and they were humane, hospitable, and friendly to strangers, except when their ready suspicion was aroused. They even refused to speak of old documents, or to show inscriptions, lest the stranger who could read them should find treasure. Like certain identical institutions amongst different nations, this wariness belongs to a particular stage of development, and must not be attributed only to race.

The village of Pirun Dubrawa (forest of Pirun) preserves the remembrance of the god adored by the Slavs of the city and province of Novgorod, before its conquest by Ivan Vassilovich, Grand Duke of Muscovy. As the old Pagans worshipped Vid, so the Christian Poglizzans have an especial devotion for St. Vitus, and celebrate his festival by burning odoriferous woods round their huts. Believing that if the perennial ice be

* Fortis, Lovrich, and Wilkinson all write *kervarina*; though the root is *kerv*, blood. Hence south of Cattaro the *Kervosje*, popularly written *Crivosje* tribe. The Morlaks fixed blood-money as high as 50, and even 60 sequins.

† The tree flourishes all over the coast and the islands of Dalmatia, except where the winds are too strong: I need hardly say that in the present state of civilisation no use is made of it but fuel. Yet it might take rank with the growths of the Thuringian mountains, which now supply the "forest-wool products and preparations," cloth, yarns, waddings, oil, spirit, balsam, and soap, medicinal articles so much used in cases of catarrh, rheumatism, arthritis, and even paralysis. Dalmatia still imports these articles from Trieste, with the pine growing all around her house. Yet the Morlaks (Lovrich, p. 11) used "*pece di sapino*" in obstructions and phthisis.

removed from their mountains, the Bora or north-easter would increase to the ruin of their farms, they object to collecting and shipping it. Like all Morlaks, they are exceedingly jealous and yet they despise the sex, and hold the name so impure that it is never mentioned without a "saving your honour's presence." De prostité, moya zena* is the equivalent of the Maltese "Con rispetto (or con perdono) parlando, la mia moglie," as if his wife were something impure or offensive. Fortis seems to think this contempt justified by the personal neglect of the women after marriage, but does he not confuse cause and effect?

The churches of Poglizza affected the Slavonian liturgy, and were served by the Glagolitic fathers of Almissa, who also laboured amongst the islandry. The military spirit is not extinct in a hardly accessible land, where every man is a man-at-arms. The mountaineers made a determined stand against the Napoleonic occupation in 1806. More than once they have threatened Almissa, and discharges of cannon are the only things which they respect. Poglizza meridionale, the maritime lowlands, are well-planted with fruit trees, and are now well known, because they supply Zara and Spalato with the best Marasca cherry, the basis of "Maraschino di Zara."

Returning to that debated ground, the Hyllic Peninsula, I may observe that some local antiquaries have been so enthusiastic as to find the sepulchre of Hyllus in the fine sarcophagus which has been placed for protection in a chapel dedicated to St. Cajo the martyr. Its triple division, representing three of the labours of Hercules, is described by every traveller. The learned Wilkinson, however, has neglected (i. 162) to notice, in the third or eastern compartment of the triglyph, the confusion of the Birds of Stymphalus with the Apples of the Hesperides.

Prof. Lanza considers the existence of Herakleia established by two coins in his fine collection; one with a metric diameter of 0.024, bears the head of a youth guardant right, and covered with a lion's hide (Herakles Imberbis!); on the reverse are the bow and the club, contained in a circle, and based by the exergue *HPA*. The second (0.013—0.016) bears the same obverse, but on the other side the bow and club are not in a circle, and the legend is *HPAKL*. Both have the letters

* Lovrich (p. 164), in the days before Slav orthography was fixed (1777), writes, "S'prosetegniem nasce xene, nasce chieri, nasce rodizce" (con perdono, nostre moglie, nostre figlie, nostro parenti," &c.), which must be pronounced Italianistically, and he tells us that there is no excusatory formula when naming a man, the latter being nobler than "que 'sporchi, villi e sozzi animali," as the Morlaks hold women to be. The idea is probably the result of an ultra-Spartan affectation of manliness and contempt for effeminacy.

well raised, and are tolerable specimens of the Greek type. According to Strabo (vii. 5, i. 484), who notices the redistribution of lands every eighth year, the Dalmatæ did "not use money, which is a peculiarity also when compared with the habits of the inhabitants of this coast; but this is common among many other tribes of barbarians." The Romans had no mint in Dalmatia, and only during the decline of the Byzantine Empire, Cattaro, Ragusa, and Spalato established their respective "Zecche."

Two medals of the Herakleian type are found in the I. R. Ginnasio Superiore of Zara, and are described by the Abate Simeone Gliubich (*Numografia dalmata*, in Italian, printed in vol. ii. "Archiv für Kunde Österreichischer Geschichtsquellen," and in the Slavic "Arkiv za poveštnicu Jugo-slavensku, Knjiga druga," Razdel i.) Heckel (Pt. i. "Catalogus Musei Cæsarei Vindoboniensis, numorum veterum") figures, in fig. 1, tab. ii., a roughly made coin, with bow and club, and the exergue *HPAK*; and in p. 47 he ascribes it to "Heraclea Taurica." He is supported by Sestini (*Moneta vetus urbium, populorum et regum*). On the other hand, the late Pietro Nisiteo, of Cittavecchia di Lesina, a distinguished student of Dalmatian antiquities, "proved," says Dr. Francesco Danilo (p. 173, "Programma dell' I. R. Ginnasio Completo di Prima Classe in Zara," 1849—1860; "Zara Tip. Governiale," 1860), "that these and other congeners belonged to the Illyrian Heraclea, mentioned only by Scylax Caryandensis, and placed on the sea-shore near the Liburni; in this opinion he was followed by Gliubich." The only "Congenero" I can find noticed is a feminine head, coiffée with a bushel, and guardant right; on the reverse is a fish, naïant dexterwise; the diameter is 0.02, and the material copper, silver being the only other metal used.

Prof. Lanza's two medals were found near Spalato; but this proves nothing; coins travel as far as beads, Holloway's pills, and cowries. My old friend, W. S. W. Vaux, writes to me that either or both may belong to Heraklæa of Thessaly, or Heraklæa of Bithynia (Taurica), which had the same type and legend; but that, without seeing the coins, it is impossible to assign the place of fabric—it can only be said that the Bithynian are the more common. To this objection Prof. Lanza rejoins, that the same type might also have been assumed by a third Herakleia, "Mentre sappiamo come gl'antichi popoli nella fondazione di nuove colonie accostumassero talvolta imporre a questo il nome ed adottare gli usi della madre patria." "At any rate," he concludes, "the find proves a commercial intercourse with the Grecian cities further east."

I visited Salona for the first time in company with Professors

Lanza and Michele Glavinić, Curator of the I. R. Museum at Spalato; the unaffected kindness of this *savant*, and his ready sacrifice of valuable time, have endeared him to a number of our countrymen. The act of escort was all the kinder in such weather; far from tepid was the turbid Iader, and no soft zephyrs were the storm-winds. The shape of the old city has been compared with a rudder, the base eastward, and the narrow part to the west. Fortis (ii. 45, Fr. ii. 59) has noticed the corruption of Cæsar's text (Bell. Civ. ii. caps 8, 9) "Salona, in edito colle," when the "oppidum munitum" lies in the riverine valley of the Iader, or Giadro; possibly, however, the conqueror may have included the fort of Olissa, the Andetrium of Pliny (iii. 26), which Fortis (ii. 48) writes "Mandetrium," and the Anderium (*Ἀνδῆριον*) of Dion Cassius (lib. lv.). Here I saw at once the form of the double city, which, after the fashion of Athenæ and Thebæ,* converted Salo, Salon, and Salona, into Salonæ. The base of the word may be Keltic, with the terminal *on*, or *ona*, signifying a town—as Albona (high town) and Lisbona, to mention no others. The chronicler, Thomas Archidiaconus (nat. A.D. 1200), derives Salona from Salo, the sea; Rosacci from Calone (Joktan?) son of Salah (*Σαλά*), son of Arphaxad (Genesis x. 25). Ortelli has doubts about the identity of Salona with the Salangon of Apollonius Rhodius (Carrara, p. 1). The Greeks, Strabo (vii. 5, § 5, loc. cit.); Dion Cassius (lv. p. 586); Ptolemy (ii. 17, 4, viii. 7, 7); "Pæonio ix." (? Pæanius, Epitome of Eutropius); Procopius (di Bello Goth. i. 7); Zonaras (Chronicon. De Diocletiano), and others use *Σάλο*, *Σαλῶν*, *Σαλῶνις*, and *Σαλῶναι κολονία*. Amongst the Latins we find the old marbles (Gruter, "Inscript. Ant. Amstelodamæ," 1707); a leaden tube of the aqueduct; Pliny (iii. 22); Mela (ii. 3); Hirtius (de Bell. Alex. cap. 43); the Anonymus Ravenne ("Europa," lib. iv. No. xvi.); Jornandes (De Regn. Success., cap. 58); and the old martyrologies preferring Salona, *næ*. The inscription referring to the road between Salona and Andetrium ("Lucio Inscript. Dalm.," p. 34; "de Regn. Dalmat. et Croatiae," p. 34; Cæsar ("de Bello Civ.," iii. 8); Lucan (iv. 4); Vibius Sequester (Glossary); M. Aurelius Antoninus (Itinerarium) affect the less usual Salonæ, *narum*. So states Carrara (loc. cit. p. 1), but the use of the plural has evidently its reason. Colonia Martia Julia Salona, occurs in an inscription (Gruter); Col. Jul. Salona on a medal of Claudius (Goltz de re nummaria Antiq.); Col. Claudia Augusta Pia Veter. Salona, on a coin of Tiberius; fragments of pottery have Salonas, and others, according to Farlati,

* *Ἀθήναι* and *Θεῖναι* (the Greek and the Egyptian), I need hardly say, are both used; but they would signify the old, or official town.

(III. Sac. i. 27) Silena. The names of the citizens and the adjectives are *Σαλῶνες*, preserved in the Acts of S. Domnius (Salones); Saloni^{us} (*e.g.* Salonia quercus) in Claudian and Servius; Saloneus in Priscus the Byzantine (A.D. 445); and Salonites in Stephanus Byzantinus; the most general are Salonitanus and Salonensis. Three other Salona^e are mentioned by the classics, one in Bithynia, a second in Gallia Narbonensis, between Marseille and Avignon, and a third in the Gulf of Corinth.

I am compelled to differ with my learned friend, Prof. Lanza, who, against the opinion of Carrara, believes the eastern to be the older portion of the double city. The western part contains the little theatre, the Thermæ, which have evidently been converted into an early Christian baptistery, and the amphitheatre, which would hardly accommodate a large and opulent community; its long oval is only 86 metres, and Mr. Paton reduces it to 126 feet. Again, the double Porta Cæsarea, the city gate* separating old town from new town, has the towers (G) projecting eastward, and the re-entering form is by no means the rule in Roman fortification. Carrara makes this royal approach connect the old Greek town with Julia Martia Salona, as the western gate of Diocletian's palace, popularly called Porta Ferrea, united it with the suburb. Moreover, in the most massive and the earliest part of the north-easternmost angle (about F), near the Porta Andertia of Carrara, I saw a Roman inscription built up in the wall, and several others are recorded by the learned Abbé, suggesting a comparatively modern origin. Finally, the western half has for its northern boundary the eastern part of the "Murazzo," or "Muro Ciclopico," and, like the long walls of the Piræus, the western part of the venerable fragment may have been left as a defence, commanding the high road to the Syracusan city Tragurium (Traù). Thus, I would believe, with Wilkinson, the long wall of Salona to be Greek, not Roman, and with Carrara to be pre-Roman.

PART II.—THE RUINED CITIES OF PHAKIA AND GELSA DI LESINA.

My conviction that the long wall of Salona is Greek and pre-Roman relies also upon the fact that similar constructions exist in the neighbourhood. Fortis (ii. 56, Fr. ii. 76) mentions them at Stobrez (Stobrech), east of Spalato, the Epetium founded by the Siculo-Issani, the Syracusan colony which held the island now called Lissa: "Veggonsi ancora lungo le rive del picciol

* This double form gave rise to the Greek *πύλαι*, and we still see the grooves for the Cataracts, which the modern Italians call *Saracinesco*. This man-trap was a porteculla, let down from above like the gate of a sluice by chains, and imprisoning those who had forced the outer entrance (Dennia, ii. 150).

Porto riconoscibili vestigj delle antiche mura d'Epezio, ch' erano fabbricate bensì di solidi materiali, ma senza quella squisitezza di connessione, che si ammira nelle fabbriche Romane." There are also ruins of a Cloaca; the parish church, distant one mile from the fort which defended the land side, is built upon the old walls; and the foundations of a tower may still be traced. Fortis (i. 33) carefully distinguished these Greek remains from the Roman ruins, those, for instance, at the modern Podgraje (*i.e.* Pod-grad, under the city), the Asseria or Assesia of Pliny (iii. 21, Bohn i. 258). Here the walls are described as 8 to 11 feet thick, 8 feet high, and "lavorate a bugna" (draughted and bossed).

The Spalatines spoke of classical ruins in the island of Lesina, which was undoubtedly colonised by the Hellenes; and my attention was drawn to one not mentioned by any foreign traveller, when reading the useful "Manuale del Regno di Dalmazia (per l'anno 1873, compilato da Luigi Maschele, Consigliere Imperiale," anno iii. Zara Tip. Fratelli Battara, 1873). The following passage occurs in p. 103: "GELSA—JELŠA.*—*Monumenti antichi*.—Due vetusti interessanti fabbricati trovansi nelle vicinanze di Gelsa, entrambi posti sopra eminenze a mezzogiorno della borgata ed alla distanza di meno d'un miglio da essa. Il più antico e posto a cavaliere d'un monte. Questo edificio, o a dirsi meglio questo avanzo di antico monumento, viene comunemente denominato *Gor* (read *Tor*) in lingua Slava. La fabbrica presenta un' opera di lavoro *ciclopico*, e fra i tre generi di tali lavori quello che veniva costituito di massi regolari di forma quadrilunga già sovrapposti uno all' altro senza cemento. Anche l'intero (interno?) fabbricato è di forma regolare, quasi pienamente quadrilatero. Per rimontare alla sua origine, bisogna ascendere ai tempi di *costruzioni ciclopiche*, che, come si sa, sono anteriori di più secoli all' era volgare. Lo scopo di tale fabbrica non può ben determinarsi; isolata, posta sopra un monte di accesso aspro ed arduo, di non troppa estesa, non sapprebbesi conciliare in essa un' idea di abitato, e nemmeno di fortificazione, perchè senza argomenti di difesa. Forse più accettabile sarebbe l'idea, che si trattasse d'un tempio antichissimo. Ad ogni modo il monumento rimane interessantissimo alla curiosità ed alle ricerche archeologiche e storiche. L'altro monumento, a non molta distanza dal primo a levante, eretto anch' esso a cavaliere d'un' eminenza, chiamasi *grad* in slavo, che corrisponde a *città* o *cittadella*. Per il genere di costruzione con pietre comuni ed a calce, per la distribuzione interna delle mura, per l'esistenza entro tale circuito di avanzi d'una Chiesa Cristiana

* The first form is Italian, the second is Slav, pronounced Yelsha.

con entro una tomba, e per l'applicazione degli avvenimenti storici del luogo si deduce, che la fabbrica stessa rimonti a tempi ben conosciuti e storici, ed abbia avuto per oggetto la costruzione d'una fortificazione per ritirata e ricovero degli abitanti da incursioni nemiche nel sottostante paese di Gelsa, che si sarebbe inclinati a riferire—anzichè alle incursioni turesche che non possono ascendere in su del secolo xv,—alle incursioni dei secoli anteriori, e probabilmente a quelli dei Saraceni sopra l'isola di Lesina."

Here, then, was at least one object well worth the traveller's study. My good friend, Sig. Francesco de' Vitturi, A. H. Lloyd's agent at Spalato, managed the transport for me. MM. Paolo and Luigi Palese, civil engineers constructing the mole and new port which are to connect with the Spalato-Siveriè Railway, the first of its kind in Dalmatia, kindly lent me their little paddle-wheeler, "*Messagero*," and absolutely refused to be reimbursed, even for the expenses of crew and coal. On Monday, December 28th, we steamed out, despite the furious sirocco or south-easter, one of the twin tyrants of these seas, which was blowing great guns in the offing. Spalato, by force of situation, which determines the rank of the world's cities, almost monopolises the rich trade of Bosnia, comprised in cereals, hides, wax, and orpiment; silk, wool, and cotton, "*libáfs*" (bed-coverlets), copper pots and metals, iron, and perhaps gold and silver to come. The staples of local production being oil and wine, great efforts are being made to improve them; and the Œnological Society, worked by my friend, M. Aristide Vigneau of Bordeaux, is doing much good, not only in making money, but in teaching the peasant on the islands as well as the main, a new lesson, to prefer quality to quantity. The port is not only the single settlement in the old kingdom which, I have said, shows any sign of progress, she is also the sole one that boasts of a truly beautiful approach. Yet when Eurus is abroad, making the sea high and the currents like mill-races, the noble amphitheatre, with its "*peaks of lapis lazuli rising in majestic splendour to the sky*," the "*imponente baja*," as Dr. Lanza justly entitles it, is compelled to veil its charms from the admirer's eye. Thick whirling mist-clouds cap the straight dorsal lines of Mons Caprarius, the Kozjak or goat-mountain of the tradition-loving Slav; the snowy peaks of Mons Auri (Mossor), which supplied the precious metal* to the Roman capital;

*Ibis litorias Macer, Salonas;
Felix auriferæ colone terre.*

* Lorrich quotes Pliny (Nat. Hist., xxxiii. 4), "*ut nuper in Dalmatia, principatu Neronis singulis diebus etiam quinquagena libras fundens, cum jam inventum in summo cespite*," and prefers the Mossor of Promina to that of Olissa as the origin of this gold.

and the regular, white-grey cone of Biôkovo, still retaining in translation (Albicans or Albiggiant) the Albius and Adrius of the classical occupants. The rack cowers before the blast low enough to hide the gap of historic Clissa, and Monte Mariano gleams ghastly white against the angry purple sky. The deep blue of the Adriatic changes complexion to an unnatural ghastly green, upon which white horses course, rear, and fall; and the bold and beautiful outlines of the islands fronting the baylet are hidden by a curtain of cold grey fog.

A few words concerning the Dalmatian archipelago, and especially this section of it. Fortis justly describes the islands as the sad remnants of a land which has been torn by torrents, mined by subterranean streams, shaken by earthquakes, and finally submerged by a new sea. In vol. i. p. 18, he asserts "*il mare guadagna continuamente sopra Zara*;" and he gives many names of submerged cities between Istrian Sipar (the Roman Siparum) destroyed in the ninth century, and the Bocche di Cattaro. Such are the flooded remnants of old Scandona, at the Lake Morigne, north of Sibenico; Nona, north of Zara, where the new settlement, called Privlaca by the Morlaks, is the Brevilacqua of the Zaratines, the Latin "*Brevia aquæ*," or shallows; the ruined wall at the entrance of Makarska port, and the remnants of Narona, now under the swamps of the Norin river, the northern affluent of the Narenta. Even at Venice, in the sixth century, it was found necessary to defend the mouths of the cisterns from seawater by raising the masonry. The whole coast of Primorje (Dalmatia Proper) has sunk, as may be seen by the sluggishness of the debouchures affecting the climate, which once was so much praised. At Lissa Island there are pisolithic cliffs, and at Lesina and other items of the Archipelago there are large tufaceous beds of rivers, apparently proving an original connexion with the coast. Finally, at the Pelagosa rock, called the "last Austrian ironclad," a long dot of land seamost of the whole archipelago, where a fanal is now being placed, two tusks of an extinct animal are said to have been found in the calcareous tufa, whose age, denoted by splendid Venuses, especially the *Pectunculus* (*pelosus*?) which still lives in the Adriatic, cannot be of great date. When Sig. Topich, mayor of Lissa, and now H.M.'s vice-consul, under whose charge is the historic cemetery of our seamen, was removing stone for the lighthouse platform, he came upon an artificial cistern or gallery, containing human bones and other matters, concerning which he has sent me notes and plans for the Institute.

Whilst the Dalmatian Sea is believed, since the days of the Paduan Vitaliano Donati (nat. 1717; ob., Bussora circ. 1760), Manfredi, and Zendrini, to have risen, that is to say, that the

shore has sunk and is still sinking, it is generally held that the maritime part of Adriatic Italy has risen, even since classical times. This seems proved by the site of Etruscan *Adria*, which named the great gulf;* once upon the coast, it is now twelve miles inland; and the same is the case with Padua, Rimini, Ravenna, and Spina towns. This slow but persistent upheaval suggests the shores of the Baltic; and in neither case can the phenomenon be explained by the constant erosion and consequent deepening of the sea, which Mr. H. P. Malet proposes to substitute for secular upheaval. When, therefore, a modern writer states of Dalmatia, "*è poi ben conosciuto che la sponda nostra dell' Adriatico gradatamente aquista sul mare,*" he evidently confounds the eastern with the western coast.

The drowned continent of the Dalmatian shore first consisted of riverine and maritime plains; these were raised by the earthquake and the volcano to hills, and, lastly, they sank below the sea-level. This theory, if correct, would give an indefinite lapse of ages for the formation of the archipelago. The older geologists made the depression synchronous with the bursting of the Atlantic into the Mediterranean basin, and thence through the Bosphorus, events usually placed at the beginning of the glacial, which followed the first quaternary, age. Geologists still hold that in the second period of the stone-age Scandinavia, Jutland, and the Danish Archipelago were connected into a single continent. And the process of island-making still continues. The bold and serrated peninsula of Sabbioncello is supposed once to have been the left bank of the Narenta embouchure; it is now connected with terra firma by a narrow isthmus, and the sinking of a few feet will reduce it to sea-level, causing total insulation. Between the Quarnero Gulf and Spalato the northern section of islands and islets, often in double chain, subtend the shore-line, whose trend, to speak roughly, is from north-west to south-east, and, as a rule, they present two parallel ridges of high ground, as if a continent had been shattered into a hundred fragments. The double chain of sunken mountains, broken by bays, sounds, and inlets, seems, when viewed from an elevated point of the coast, to fit into the terra firma as if once joined on to it. But about the parallel of Punta Planca, the westernmost projection of Dalmatia, the shore-line bends into an important chord concave to the north, and here the chief islands, Brazza, Lesina, Lissa, Curzola, and Lagosta change from a diagonal (north-west—south-east) rhumb to a parallel of latitude, the length of all four being disposed almost due east and west (magnetic). Finally, further

* A few, but very few, have called the Adriatic from *Adria* (Hat or Hatri, *hōd. Atri*) of Picenum, the modern Abruzzi.

south, as far as the Bocche di Cattaro, where the archipelago abruptly ends, the groups re-assume the diagonal trend of the northern section.

We had some grief in traversing the Canale della Brazza, between that island and the continent, and again the little steamer was heavily shaken by a cross sea in the Canale da Greco di Lesina, which has Brazza to the east. Fortunately, however, my kind-hearted and obliging friend, Cav. Pietro G. di Leva, an old Pacific voyager, now port-captain of Spalato, had taken the precaution to send with us Gospod Dumantich, his chief and most experienced pilot. After four hours, we found ourselves running S.E. in smooth water, with Port Pellegrino to starboard, and the highlands of Port Kubal to port. At the bottom of the bay lay Cittavecchia, or Starigrad, and here I was hospitably welcomed by Capt. Pietro Ivanisovich, the Podestà or mayor.

The island of Lesina, says Capt. Giacomo Marieni (pp. 331—349), in that fine folio the "*Portolano del Mare Adriatico*," (Milano, Dall' I. R. Stamperia, 1830) is one of the largest and the most populous of the Dalmatian Archipelago. Its length from east to west is thirty-seven (Italian) miles, whilst the breadth varies from two to three. Fortis gives these figures forty-four, and a maximum of eight. Until the early part of the present century it was well wooded; its forests of the *Pinus maritimus*, which Linnæus ignored, combined with its peculiar, long, narrow shape, gave rise to its two known names, the original Liburnian having wholly lapsed into oblivion.

The Greeks called it Πάρος or Φάρος, which we find in Scylax Caryandensis (chap. 23) ἐνταῦθα γάρ ἐστι νέος Φάρος, νήσος Ἑλληνίς, καὶ Ἰσσα νήσος, καὶ πόλεις Ἑλληνίδες αὗται. Appolonius Rhodius, describing the passage of his knight-errants, the Argonauts, terms it Πιτύεια, or pine-island (πιτύς = pinus) in this verse (iv. 564):

Ἰσσα τε, Δυσκελαδὸς καὶ ἱμερτὴ Πιτύεια.

Upon which the Scholiast remarks, Λίγυρνοι ἔθνος οἰκοῦντες ταύτας τὰς νήσους, Ἰσσαν . . . μεθ' ἅς εἰς Κέρκυραν ἦλθον. τὴν δὲ Πιτυοῦσαν καλουμένην Πιτύειαν εἶπεν Ὀμήρῳ ἐπόμενος. Some authorities have applied "*Pityeia*," without sufficient reason, to the wooded rock of Sant' Andrea, where pitch was drawn by incision. "*Dyskelados*," according to Fortis (ii. 163; Fr. ii. 222), is the title of Issa (Lissa); the "*harsh-sounding*" is generally understood to be Cratia (Κρατία), Crathis (Κράθις), Bractia (Βρέκτια), or Brattia, the Βάρτζω of C. Porphyrogenitus, and the modern Brazza, still so heavily visited by the howling Bora (north-easter). Pliny (Nat. Hist. iii. cap. ult.) applies to

the fifty islets and rocks of Sibenico the collective name of Celadussæ, supposed to be derived from Dyskeladoi; and Fortis (i. 170, Fr. i. 235) thus amends the corrupted text, "Nec pauciores Trucones (insulæ) Liburnicæ. Celadussæ contra Surium (Zuri Island). Bubus (Bua of Spalato), et capris laudata Brattia."* Scymnus Chius (Periegesis, l. 427) adds another detail:—

Φάρος δὲ τούτων (the Illyrians) οὐκ ἄπωθεν κειμένη
Νήσος Παρίων κτίσις ἐστίν.

Diodorus Siculus (xiii. 3, 4) relates the decree of the oracle which determined the Parian emigration, and dates the foundation of Neo-Paros from the year "when the Elæans were celebrating the 99th Olympiad (B.C. 385). The new-comers expelled the barbarians, who took refuge in a very strong village, and quickly founding their city near the sea, walled it round and held it for 166 years. Strabo (vii. 5, s. 5) refers to it as Ἡ Φάρος, Πάρος λεγομένη πρότερον. It is the *Pharia* of C. Ptolemy (ii. 16, s. 14), who applies the term to isle and capital, and the *Φάρα* of Const. Porphyrogenitus (De Admin. Imp. cap. 36). The Romans, as we learn from Pliny (N.H. iii. 30), preferred Pharia, probably pronounced Pharía, and the Slavs, who convert Ph and F into Hv (= Kh in such Persian words as Khar and Khwár), have retained Hvar, evidently from Phar(ia) or Far(ia). "The name is given in ancient documents to the island and, after the foundation of Lesina town, to Cittavecchia."†

There can be no reasonable doubt of this identification when we inspect the coins turned up at Cittavecchia. In the days of Fortis (1772) a single specimen was known. Prof. Boglić (loc. cit. p. 18) mentions but three silver in 1873, one described by Sestini, a second owned by Sig. G. Macchiedo, and a third in his own cabinet. The "Programme" before alluded to describes (p. 171) five copper medals in the Gymnasium of Zara, not to speak of the many preserved elsewhere. The characteristics are the virile heads, bearded (Jove?), or imberb, nude, laureated or crowned, and guardant dexter or sinister. The reverse often shows the goat (Caprone), derived from Paros of the Cyclades, and No. 5 bears four rays above it. Prof. Lanza's copper specimen seems to have an olive branch over the animal's crupper. The exergue is Φ, and the diameter varies from 0.019 to 0.024. Prof. Ljubić (or Gliubich), of whom more presently, declares (p. 8) that the different *types* found at Cittavecchia exceed one hundred, a number surpassed by few ancient cities.

* Bostock and Riley (Bohn i. 266) thus pervert the passage: "Opposite the Liburni are some isles called the Crates, and no smaller number styled Liburnicæ and Celadussæ. Opposite to Surium is Bavo, and Brattia famous for its goats."

† This statement of Prof. Ljubić (p. 33) is contradicted by Prof. Boglić (p. 34).

He gives as the chief obverses the heads of Ceres and Homer; the reverses bear the serpent, the goat, the pine, and the two-handled wine-jar, emblems of agricultural prosperity; the exergues are mostly ΦA and ΦAP , sometimes $\Phi APION$, and IIA (Boglić, p. 18) in only one specimen found at Lesina town.

According to Sig. Giacomo Boglić (p. 31, *Studi Storici sull' Isola di Lesina* di G. B. Prof. nell' I. R. Ginn. di Zara: Zara Tip. di Gio. Woditzka, 1873, Fasc. 1, pp. 5, 31), the Slavs originally called Pityeia "Lisna," and subsequently Lesna, Liesna, Liesena, and Lesina. He quotes the Lesignano, Vinc. Priboivo (Venetiis, 1525), who terms it "Lisna," adding, "corruptius autem Lesina dicitur." Yet Prof. Ljubić (p. 30, "Faria," &c.) notes that in a document dated June 19, 1103, by Koloman (A.D. 1095), son of St. Ladislaus, of Hungary, and quoted by Lucio (vi. c. 4), and Farlati (iii. 164) has "et villam Lesina Stolez." Ambrogius Calepinus (p. 226, "Onomasticon propriorum nominum. Basilæ," 1598) speaks of the "insula quæ nunc vulgo Lisna Illyrico sermone dicitur." Prof. Boglić would derive Lisna (the woody) from Lies (a wood), quoting the *Lexicon Serbico-Germanico-Latinum* (p. 328, Edidit Vuk Stef-Karadschitsch, Vindobonæ tip. Mechit., 1852) "Lies (u Hreegovini) *Silea*. Blagi jezika Slovinskoga (in the blessed Slav tongue), (p. 232, Laureti, 1694) *Lia*, *Lies*. To jes driva za poslovati (i.e. wood to work). . . . *Lignorum apparatus*. In Bosnia there is a Mount Lisina and a River Lješnica; Serbia owns three villages called Lješnica, and at Rudine, near Cittavecchia di Lesina, we find the Valle Lesnà and the Punta Lesnirat. As the Slavs make little difference in the articulation of the i, the e, and the diphthong ie, the name was written in the public documents of Venice indifferently Lisna, Lesna, Lesina, and Liesina. Finally, in the early 19th century, the shape of the island suggested the modern and popular Italian form "Lesina," meaning a "cobbler's awl," and the true term (Lisna) lapsed into oblivion.

According to Professor Boglić, the island abounded in pre-historic or proto-historic remains, whose origin he wisely hesitates to determine. His description is as follows (pp. 7 & 8):—

"Monumenti sepolchrati ci restano sull' isola, e molti intorno alla città di Lesina, i quali senza dubbio rimontano all' epoca seconda dell' età di bronzo. Parecchi ne furono aperti, sono dodici anni circa (about 1861), per cura dei Signori Gregorio Bucic e Pietro Boglić. Erano essi formati da grosse lastre di pietra non isquadrate, lunghi dai tre ai quattro piedi, larghi due, e a un dipresso altrettanto alti. Enorme la grandezza del coperchio, e di alcune delle lastre laterali poste sempre per coltello (on edge).

“Ecco quello che mi scriveva il Sig. Gregorio Bucic riguardo il coperchio—‘una sola era la lastra che serviva di coperchio, e sempre massiccia assai e greggia—una volta massiccia tanto che conviene frangerla col farvi cadere dei grossissimi sassi, essendo stato impossibile sollevarla a braccia, sebbene molti operai si lavorassero intorno.’

“E siccome non poterano estrarsi sopra luogo, chè a ciò non prestavasi la natura del terreno, fanno suporre sforzi e fatica somma, perchè potessero trarsi lassù senz’ajuto di macchine. Queste tombe costruite sopra terra, senza calce, sempre in cima di qualche collina, protette erano dalle ingiurie del tempo e degli animali da un tumulo di sassi, alto fine a dieci piedi, di una periferia che talvolta aggiungeva i cento, e la cui sommità finiva per lo più in pietre di considerevole mole. Le tombe non giacevano mai nel centro del tumulo, ma erano poste alquanto a levante. In una si trovò conservata una parte di un cranio, e dei carboni, in un’altra pochi carboni, due vasetti di terra cotta; taluna conteneva ossa frammiste di adulti e di bambini. Si raccolse un fuso di bronzo, e dello stesso metallo una fibbia a semicerchio, un anello, un amo, alcune di quelli spirali che sono caratteristiche di quest’epoca, e pezzettini di ambra.

“I vasi, gli oggetti di bronzo coi pezzettini di ambra allora trovati, si conservano a Lesina dal Sig. Girolamo Machiedo, ma le ossa del cranio, ed il femore furono riseppelliti, e forse non erano di minor interesse per la scienza. Il Dr. Francesco Unger, Professore all’Università di Vienna, rapito troppo presto all’affetto and alla gratitudine dei Lesignani, avendo esaminato nel 1864, gli oggetti di sopra accennati, anch’egli li giudicò dell’età del bronzo.

“Qualche sepolcro era vuoto, nè pare che prima sia stato aperto, perchè non si vide alcuna traccia di lavoro intorno al tumulo, nè appariva che le lastre delle tombe fossero state smosse. In questo non mancava il terricio (*black degraded earth*), prodotto dall’azione dell’umidità e del tempo sui resti animali, che vi erano stati deposti. In nessuna si trovarano oggetti di ferro. Molti anni prima alcuni agricoltori, spinti dalla speranza di arricchire con tesori nascostivi, spianarono dei tumuli, e diseppelevano un grande vaso di terra senza manico, ed un martello di bronzo, scarso compenso al lungo e penoso lavoro. In uno dei sepolchri da essi aperto, tanti erano i carboni accumulati, da dover sospettare che entro sia stato abbruciato il cadavero. La tomba non era sempre lunga così da contenere il cadavero disteso di un uomo, e siccome da ossa trovate senza tracce di fuoco, si vede, che non tutti i cadaveri venivano arsi, convien credere, che in qualche caso si ripiegassero; tanto più

che la periferia di un cranio, desunta dalle ossa parietali e dall' occipitali bene conservati, e la lunghezza di' un femore mostrarono, che gli uomini a cui appartenevano erano di statura anzi alta, che mediocre, e di grosse proporzioni. La forma piramidale dei tumuli, il colore, e la grandezza delle pietre che ne costituiscono l'esterna corazza, il sito elevato, sterile, sassoso, su cui s'innalzavano, li fanno tosto riconoscere e distinguere dalle macerie (*heaped stones*) di egual mole costruite dagli agricoltori colle pietre tratte dalle pendici delle colline che dissodano. Devesi deplorare che quando si spianarono i tumuli, nessuno si sia pensato di studiare più attentamente questi monumenti dell' età preistorica. Se con questo scopo e con maggior cura fossero stati eseguiti i lavori, si sarebbero ottenute più precise indicazioni, e forse tra i vari sepolcri sarebbesi potuto rilevare un grado diverso di antichità."

The passage is interesting, because it shows that Lesina contained a style of tumular architecture dating before the Iron age, and thus equal in antiquity to the oldest Etruscan remains which lie on the confines between the Bronze and the Iron.

Cittavecchia de Lesina, the "*Civitas Vetus*," which the Slavs, rendered by "*Starigrad*" (old fenced city), opposed to *Civitas Nova*, *Novigrad*, or Lesina town, is the usual Veneto-Dalmatian port-town, a gathering of big, dull houses rising from narrow alleys, which were neither paved nor lighted till the reign of the present Podestà. The redeeming point is the neat riva or quay of cut-stone—a luxury found throughout this seaboard from Sibenico to Cattaro, and still wanting on the Surrey side of the Thames. The little port requires a prolongation of the rudimental mole, at whose base stands the Sanità-box, as westerly winds drive, at times, the billows right home, to the imminent danger of the shipping. The four churches, including S. Pietro, the Dominican monastery, do not exceed the usual allowance, and the Parrocchiale and ex-cathedral (?)* of S. Stefano, which has a *cachet* of its own, bears over the entrance of the belfry this barefaced inscription in the baldest Latin—

*Dederunt hujus primordia molis de manibus urbis reliquie,
Et que dederat grossum in urbem janus, nunc in templi sacrarium.*

The people, who number a maximum of 4,000 out of a total of 14,000 to 15,000 islanders, regret that their "city" was not built on the sloping ground a little farther north, where the

* For the origin of the bishopric at "*Sancte Marie*" (Gospoica, the little "*Plebania*" built in A.D. 1322) de *Faria* (Cittavecchia) and its "illegal" transfer to Lesina town, see Ljubić, pp. 32-37. He is refuted by Boglić (p. 56). The latter quotes (Du Cange, *Glossarium*, Parisii Didot, 1842, vol. ii. 241) "*Cattedra ipsa sedes seu Ecclesie Cathedralis. Eodem nomine designantur interdum ecclesie parochiales, precipue in urbi episcopali.*"

drainage would have been better. High-spirited and industrious, stout fishermen and gallant sailors, they leave their women to till the ground—

*Femina pro lana cerialia munera frangit
Impositoque gravem vertice portat aquam—*

and they take a pride in calling themselves the English of Dalmatia, a distinction which they amply deserve. Their island yields grain enough for five months only; the other eight must be supplied with bread from the Danube and the Black Sea.* The chief local cereal is barley, the rains not being heavy enough for "fromenton" or maize. Wine is abundant, alcoholic enough to suit the English market, and much resembling the Lavradio and the inferior growths of Port. The olive thrives everywhere, and at this season the streets and stairs are rank and slippery with oil. The Chambers at Vienna, influenced by a great monopolist company, have lately done an unwise and unpopular thing in refusing an annual subsidy of 20,000 florins to an inter-insular line of steamers. The difficulty of intercourse here causes not only inconvenience and loss of time, it also affects the trade of many communities, and renders their progress and development next to impossible.

I at once inquired about the so-called "*Muraglie ciclopiche*," a term adopted throughout Dalmatia from Dodwell ("*Views and Descriptions of Cyclopean or Pelasgic Remains*," &c., a paper posthumously affixed to his "*Tour in Greece*"); from Petit-Radel, who proposed the theory in 1829, and who developed it in 1841 ("*Recherches sur les Monuments Cyclopéens, et description des modèles en relief composant la Gallerie Pélasgique de la Bibliothèque Mazarine*," Paris); and by Cesare Cantù in 1846 ("*Dei Monumenti di Archeologia*"). A local antiquary has determined the walls of Pharia to "belong, without doubt, to the second species of Pelasgic construction," the first being "irregular polygons, uncut, or cut after the Lesbian rule, concerning which the author, '*De Mirabilibus*,' speaks." Sig. Girolamo Budrovich, formerly Sindaco, and now Agrimensor (land surveyor) of Cittavecchia, has succeeded in outlining the limits of the old city—of course, only the official portion—an oblong measuring about an Italian mile in circumference. The dimensions of the enceinte were 36 feet in thickness, and the height was conjectured to be about the same. Possibly the norm which Fortis applied to Aseria (Podgraje) has been fitted to Pharia. The fragments best preserved are in a cellar (Cantina di Gram-

* The Euxine is in every mouth; for instance, *Fortuna nel Golfo* (Adriatic) burrasci in *Mar Nero*; and during a storm they will exclaim, "*Poveretti nel Mar Nero!*"

motor), where, however, they are almost concealed by gloom and lumber; outside the town, about 10 metres rise above ground near the Casa Domchich; and the foundations remain in many places uninjured. Hence a description and, I believe, a plan were published in the Instituto Archeologico of Rome between 1840 and 1848.

Accompanied by the gentlemen of the town, I visited these interesting remains, and found the masonry to be pseudo-isodomic and isodomic (regular horizontal layers), parallelopipedons of considerable size, cut from the limestone of the neighbouring hills, hammer-dressed, and fitted upon one another without cement. I nowhere remarked bossed and draughted stones, but Sig. Budrovich assured me that they existed near the city, and he presently obliged me with the following three specimens. The measures are in Viennese feet and inches.



FIG. 1.



FIG. 2.



FIG. 3.

The central projection above the draught is 4 inches in fig. 1; 1 inch 6 lines in fig. 2; and 2 inches in fig. 3.

The good Agrimensur was also kind enough to inform me by letter (Feb. 4, 1875), that about an Italian mile outside the town he had found masonry which appeared to be of the oldest date. Fortis (ii. 176) had previously copied a Latin inscription "perhaps a mile from Cittavecchia."

There has been since the early 14th century—probably long before it—and there still is, a mighty feud between Cittavecchia and her south-western neighbour, the "Hauptstadt" of Lesina, about the right of representing the ancient Pharia of Demetrius of Paros. Fortis (ii. 175), guided by a local tradition, would place the site some two miles further inland, where ruins are also found; these evidently belong to some forgotten item of the five classical towns. In our day the leaders of the war are the two following literati.

Professor Boglić (p. 26, *loc. cit.*) rather "trims" between the two. According to him, the Paros built by the Parians in the 4th century B.C., and utterly destroyed by the Consul Lucius Emilius Paulus in B.C. 219 (Livy, Polybius, Dion Cassius, Florus, Appian, and Justin), occupied the site of modern Lesina. The neo-Pharos, the νέος Φάρος of Scylax (?); the Ager Colonius of the Romans; the Oppidum Pharia of Pliny (iii. 26); and the Pharia city of Ptolemy (*loc. cit.*),* which

* Consult the "Faria," &c., of Ljubić (pp. 25—28), for proofs of the Roman epoch between B.C. 219 and A.D. 639.

lasted till the end of the 5th or the early 6th century, when the Slavs found it in ruins, was built where Cittavecchia now stands. On the other side, the doughty abbé, Dr. Simeone Ljubici (Gliubich), at present professor in the I. R. Gymnasium, and Curator of the Museum of Agram ("Faria Città Vecchia e non Lesina," Zagabria. Carlo Albrecht, 1873, an octavo of 68 pages, printed with the aid of the municipality of his native town), sounds no uncertain note. The following is the merest outline of his arguments (pp. 7, 8) in favour of Cittavecchia; of course most of the statements are traversed by Prof. Boglić. The latter localises near Lesina town the attack of L. Emilius Paulus, who razed the city which the Parians built in B.C. 385. He mentions (p. 15) an ancient mosaic two feet below the surface of the Bishop's garden in modern Lesina; another near the Mandracchio, or dock port; a fragment of granite column about two inches long; a pair of the sepulchral lamps called by the Italians "lume eterno"; and a multitude of coins, especially twenty-two of Ballæus, found in late years on the slopes crowned by the Forte Spagnuolo.

a. The existence of the old walls of Cittavecchia resembling the Palæokastrā of Albania, &c., &c.

b. The many Greek inscriptions bearing the initials or the words *Φάριοι* and *Φαρίων*, and showing the old democratic republic to have been governed by Archontes, Prytaneis with their *Πρυτανείον*; a Senate (*Βουλῇ*) and a Scribe (*γραμματεῖος*) in the public *Ærarium* (*ἐν τῷ δημοσίῳ*). Another inscription, "di argomento inverecondo," is a Psephisma, or decree regulating the public prostitution which seems to haunt every port.

c. The multitude of Pharian coins inscribed *ΦΑ*, *ΦΑΡ*, and *ΦΑΡΙΩΝ*, and bearing the name of Ballæus (*ΒΑΛΛΑΑ*, *ΒΑΛΛΑΙ*, *ΒΑΛΛΑΙΩΤ*, and *ΒΑΛΛΑΙΩΤ* (?)), at first Archon, and lastly tyrant (*Βασιλεὺς*) * of his native Pharos.

d. The number of other classical coins which have come to light.

e. The incised gems and cameos.

f. The sarcophagi "of primitive or Greek style, almost invariably anepigraphic," containing mortuary objects. One of these, discovered in 1869, when prolonging the riva southwards, yielded a gold ring with incised stone, and an exquisitely made chain of the same metal; both are now in the Museo del Tri-regno of Agram. "Some of the mortuary urns much resemble in shape those of Issa, which are undoubtedly in the Liburnian style."

* Prof. Ljubici (p. 9) gives *Βασιλειος*, but as there is no accent, the omission may be a misprint. He is also the authority for the form *ΒΑΛΛΑΙΩΤ* (p. 9). Prof. Boglić says that the coins bearing *ΒΑΣΙΑ* are very rare (p. 18).

g. The marble bas-reliefs and similar objects, the three principal being—1. A mortuary genius, with reversed torch in the right hand, and in the left a bunch of grapes; it is a coarse production, placed on a pedestal of cut stone at the corner of the little square fronting the parochial church. 2. A Milo of Crotona, in mezzo rilievo. 3. A marble slab, showing an archaic Grecian galley, steered by a pilot. The last is high up in the Campanile; it is noticed by Fortis (ii. 175, Fr. ii. 238) as “un bassorilievo sufficientemente ben conservato in marmo Greco, che rappresenta una barca a vela, col timone alla destra della poppa, ed il piloto che lo governa.”

On the other hand Lesina, says the Abate (p. 11), shows no signs of those “primitive (Pelasgo-Illyrian?), Greek and Roman monuments. The town (whose origin is lost in the glooms of the middle ages) is stuck against a nude and savage rock; it has no *agro* (open ground) even to the south, and the few yards of dry surface forming the actual square, and bearing, amongst other edifices, the Duomo and the Episcopal Palace, were covered by the sea within the memory of man; in ancient times they must have been deep water,” &c., &c. Finally, the erudite professor quotes a host of authorities, who reject Lesina and support Cittavecchia.

He has, however, omitted to notice that the position of Cittavecchia is exactly that of ancient Salona—a recess, a sinus opening westward with higher ground to the north and south, thus defending it from the Bora, as well as from the Sirocco. Lesina, seated like Spalato, on the very edge of the mainland, faces the south with a much greater amount of exposure.

All the Cittavecchiani declared, to my unpleasant surprise, that they had never heard of “Cyclopean stones” at Gelsa. I determined, however, to judge for myself, and, kindly guided by the Deputato di Sanità, Sig. Gio. Actinovich, I set out to cross the island. The distance from Cittavecchia to Gelsa measures upon the map 4,000 Viennese klafters (= 8296.82 English yards, = 4.714 statute miles). Under the *justum et per mundum approbatum regimen* of the Serenissima Repubblica, to which Lesina was yielded in A.D. 1420 by its last Count, Aliota Capenna,* this highway was a good *calçada* of cut stone and lime; now it resembles nothing more than a torrent bed, except during heavy rains, when it becomes a shallow torrent, a

* According to Prof. Boglié (p. 50), Petrana, the Venetian Count of Zara, compelled Lesina to undergo the yoke about A.D. 1144. There was a second rendition in A.D. 1278 (p. 73); the final subjection after the last sway of the Hungarian sceptre was in A.D. 1420 (p. 103). The three commissioners who acted in the name of the Reggenza (count and judges); the nobility and the university (popular assembly), were Giovanni Ozor (de Ozorio), Vital di Silvestro, and Vito di Tomaso (Jan. 3, 1421).

fiumara, or, in local dialect, a "potok." It is everywhere enclosed, first by tall masonry, and afterwards by dry walls.

The almost level surface of the ground, a shallow prism, with highlands to the right and left, would represent the old Pharian *ager*. Its clothing of rich, ruddy clay, the produce of degraded chalk and ferruginous lime, is scattered with water-rolled bits of "breccia corallata," from the summits of the southern range. Fortis supports that this material is the "Tragurian marble," so highly prized by the Romans—angular fragments of white calcaire encrusted in a cement of petrified ochraceous earth, susceptible of a high polish, and often confounded with the African. He never found amygdaloid, nor pudding-stone, but always large, flat, angular, and irregular pieces, interrupting the continuity of the texture. These breccias, being frequently met with *in situ*, upon the summits of the Dalmatian ranges, confirm him in the belief that the islands were once part of the continent. I remarked that in some cases the white marmarine limestones set in the blood-red paste were rounded like true conglomerates, and I heard of a vinous coloured rock, probably the "Rosso da Cattaro" of Venice, which may be seen in the pavements of streets and churches at the place which gives it a name.

The route became more sandy as we approached Gelsa. The ground on both sides, broken into hill and dale, was enlivened by white-churched settlements, which are rather miniature cities than villages, and nowhere in Dalmatia had I seen dimensions so considerable. Thus we read in 1798 ("Engel, Geschich. v. Dalm. Allgem. Welthist." Halle, xlix. 228), "Verschiedene Dörfer derselben (Lesina) verdienen dem Namen von grossen Flecken, und sind stärker bewohnt als viele kleine Städte." The phenomenon is doubtless due to the comparative wealth and abundance of the island, which bears besides wine and oil, figs and almonds, saffron and honey. The rakia (raki of the nearer East) is particularly good and plentiful; the aloe flowers as in Greece, and at Lesina the fibre is made into fancy articles, purses, and nettings. Although the woods have been unwisely thinned, and re-forestation is requisite, palms and carobs, oranges and mulberries everywhere thrive. Sheep-wool and cheeses have taken the place of the salterns which, in 1772, formed the chief local industry, and the habit of long voyages has not abolished the fishery of anchovies, mackerel, and sardines, with which Lesina, in the days of Bosching, supplied Italy, and even Greece.*

* In 1861 a certain Sig. Carlo Warbenek began to cure sardines in oil at Fiume, and presently transferred his establishment to Gelsa, the centre of the Dalmatian sardine-fishery. But the want of transport and the excessive tax on

On the right I remarked the settlements of Dol, Sfirze (Svirze? in Ital. "Sfirce"),* and Verbanj, whilst to the left rose the fine large houses with which the little port of Verboska was adorned some three centuries ago. Half-way we passed a dilapidated little chapel, which my good guide called S. Cosmo, and which appears as S. Vito in the official map of the Austrian Empire (Special-Karte des Königreiches Dalmatien, &c., &c., von dem K. K. Militärisch-Geographischen Institute in Wien, 1861—1863). Beyond Verbanj we fell into the valley of the "Potok," as the streamlet of Gelsa is generically termed, and crossing a big stone bridge, we presently found ourselves in the little town. Here we were met by the Podestà, Capitano Nicolò Dubrocvich, for whom I bore a letter from the friendly Prof. Glavinić. He led me to his house, introduced me to his family, and made me feel thoroughly at home. Most of the mayors in the Dalmatian Archipelago are retired *Capitaines de long cours*, substantial men with large estates, who, during their voyages, have accumulated not only capital, but a large stock of refinement and general information. In this point insular Dalmatia much resembles Switzerland.

Gelsa, in the official map Gjelsa, and by the Slavs called Jelša, is often mentioned in local history. It appears to have been an ancient city, whose name is now lost. The Statuto di Lesina, compiled in A.D. 1331,† as the preface says, by a Russian lawyer, whom lung-disease drove to Venice, thus speaks of the ruins in A.D. 1407, *Civitas Vetus (Gradina) in Jelša* (p. 202); and in 1425 we read (p. 217) "*inter civitatem Jelsæ . . . prope civitatem veterem in Jelša.*" As will be seen, it was presently distinguished from the other *Civitas Vetus* (Cittavecchia) by taking the name of its fine fountain. Also Rafaele Luacovich (in *Farlati Ill. Sacr.* i. 197) says, "*Pagos habet (the island) civitatibus haud absimiles; Gelsam fontibus perennibus divitem. Verboskam ubertate agri pinguem,*" &c., &c.

The townlet occupies the head of a bight opening to the north-east, crossed by a masonry dam, and made tolerably safe for shipping by two short moles on the north and south sides. A few good houses, amongst which is the Podestà's, prefer the northern shore; the mass of the settlement lies opposite. It evidently owes its origin, as well as its name, to a perennial spring of the purest water, which wells up near the piazza.

oil compelled him to remove the "Fabbrica di conserve" to Barcola (S. Bartolo), in the Bay of Trieste.

* All the names of towns (except Cittavecchia), hills, and dales are purely Slav. The orthography would be Vrbanj and Vrboska.

† Of this *Liber Statutorum Communitatis Pharse*, afterwards printed under the name "*Statuta Communitatis Lesinae*," Venetiis, 1643, see Boglić (pp. 112-129).

The Statuto (pp. 50, 51) says, "usque ad fontem vocatum Jelsam, quæ est apud mare salsum." It has its "Parrochiale"—

Half church of God, half castle 'gainst the Moor;

and its cemetery around the deserted Augustine monastery. It wears a thriving look, and I heard with pleasure the sound of the bell which rang the boys to church. A wire connects it with Spalato, the *chef-lieu*; and, indeed, nowhere about the Mediterranean have I found this instrument of our later civilisation so generally used as in Dalmatia. The principal want here is communication; those who would embark must ride for half a day over the roughest path, spanning mountains and valleys, to Lesina town, the only station of the Austrian Lloyds.

In 1772 Fortis (ii. 178, 179; Fr. ii. 242) described Gelsa as "un grosso villaggio ben situato," well-peopled with citizens dressed à la Française, and boasting not a few good houses and villas. The port receives many perennial streams, and the hills, which slope gently to the sea, produce the finest marmorine breccias, which are used for coarse pavement, or are built up in pauper huts. Besides the "corallata" before mentioned, there is a stone with irregular stains of pavonine colour, taking a polish which equals that of the finest Roman conglomerates. Mgr. Blascovich, Bishop of Makarska, took from its quarries all the material for the columns of his new cathedral, and for the steps and pillars of his altars. Unhappily, the cutters will save time and trouble by contenting themselves with the upper strata; the softer portion, especially the natural cement, containing the marble, is thus degraded by the atmosphere, perhaps also by seawater, and it soon deteriorates when exposed to sun and rain. Fortis also remarked a black and white lunachella, composed of hardened bituminous earth, and orthoceratites, changed, as usual, into a sparry saline calcaire. He does not notice the ruins either at Cittavecchia or at Gelsa, for the good Abbé was a naturalist rather than an antiquary, and he seems somewhat sore about his reception. The fishermen were perhaps at sea, and "quando io giunsi colà non trovai quella cortesia, che suole abitare colla povera gente." Thus his experience and mine differ *toto calo*.

Tuesday (December 29th) appeared in its very ugliest guise. The climate of fair Dalmatia can, like certain Madonna-faced beauties, show an amount of ill-temper as serious as it is startling. I rose in the dark, hardly hoping to see my host, but he was no "marinero di acqua dolce," justifying the old saw,

Di sera leone,
Di mattina babbione;

and he cared not a jot for the frenzied gusts, the Scotch mists,

and the showers which fell as if buckets were being emptied upon the hills—in these latitudes, when it rains it *does* rain. During the evening we had learned that two ruins were to be visited, the “Grad” and the “Tor,” the former bearing from his house, “Ostro quarta e mezza Sirocco” (S. by E. $\frac{1}{4}$ E.), and the latter “Ostro e tre quartini Levante” (S. $\frac{3}{4}$ E.). The time would take an “oretta”—beware of the “little hour” in Dalmatia and Istria. On this occasion, however, it was only double.

Passing through the townlet, we began the ascent of the low and ruddy outliers of the Gvezdjena Gora (Gvezd Berg of the map), or Iron Mountain, a long range running nearly upon a parallel of latitude. The reason of the metallic name is unknown; perhaps it is derived from the steel-grey spines, bands, and cornices of the hardest limestone, which accident the slopes. Beyond the Madonna della Salute the goat-path became stiff and stony, slippery withal under mud and rain.

On these islands the traveller in search of prehistoric remains becomes, after a fashion, an explorer. He must visit everything that bears the name of “grad,” or its multiform derivations,* and, as in Africa, he must labour to ascertain what there is not, as well as what there is—*ea quæ sunt, tanquam ea quæ non sunt*. After breasting the iron height, we reached this particular “grad,” and the first glance told me that the masonry, which might have been Venetian, was more probably post-Venetian and Slav. The aneroid at 28·9, and at a sea-level, 29·9, showed an altitude of a thousand feet, and the site was that of an Etruscan city, a “Mull,” the Icelandic “Múli,” or loop of high ground, with a declivity more or less precipitous on all sides but one—here the western. The rock fell sheer to the south; the neck had been fortified, but the outworks were so ruinous that their form could hardly be ascertained. The enceinte followed the contour of the ground; in places it was based upon the limestone, at this and in other parts forming parallelopipedons by stratification and cleavage, which easily suggested the “Cyclopean wall.” Here and there it is difficult to distinguish the natural from the artificial, so exactly do the joints correspond. Fortis remarks the same of the sandstone, and he figures (Table xii. vol. ii. 100) the natural wall (“filoni simili a muraglie”) of Rogosnizza. In Istria I should have thought that the origin of this “grad” might have been one of the so-called Castellieri. A dilapidated cistern-shaped affair, showing the spring of the arched roof, and facing southwards with westing, is, according

* The curious reader will consult the paper on the “Castellieri of Istria,” which it was my evil fate to publish with the Anthropological Society of London (“Anthropologia,” No. iii. Oct. 1874).

ELEVATION OF THE TOR.

Shows the draught and boss at North corner.

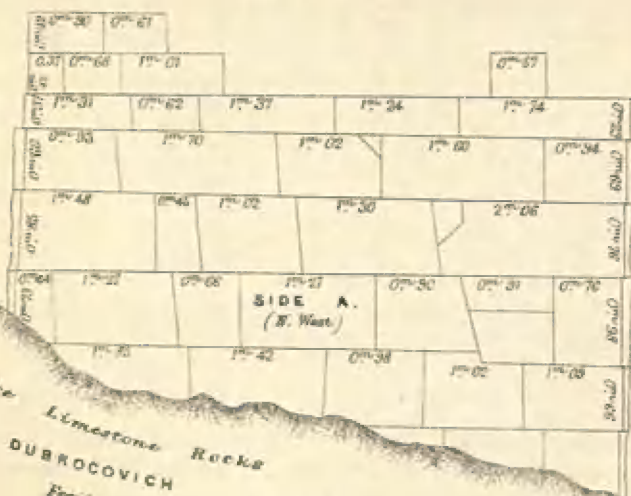


Fig. 3.

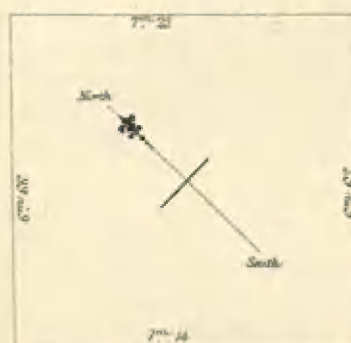
Scale in Metres. 1 2 3

Fig. 2.

DALMATIAN FIND.



Axis of fine Greenstone found at Salona near Spalato. Apparently broken about half-way.



GROUND PLAN OF TOR DI GELSA. SIDE A.

Fig. 4.

Fig. 1.
DALMATIAN FIND.



One of the two Seta implements in the Museum of Spalato, the first. Found in Dalmatia. Flakes of clay colored. First edge jagged, possibly used for lighting pipes. Found close to the frontier of Bosnia.

to the legend, the burial-place of its "king," Subich (Subij). All traces of the tomb have lately disappeared.

Professor Boglić tells us (pp. 126, 127) that this "Grad Galicnik" is described by the monk Priboevo, of Lesina, and quotes as follows from a manuscript letter addressed to H. E. Gio. Bragadin in A.D. 1723: "Sulla di lui sommità (the mountain near Gelsa) v'è un recinto di mura, da Oriente (poggia) sull'orlo di sasso dirupato. L'opera è in quadro, lunga 30 e più brazza (a minimum of 21·83 yards); larga nell'ingresso brazza dodici (8·73 yards); in fondo brazza otto (5·82 yards) incirca. Si vedono nel di lui mezzo due casette, una diroccata ma angusta; l'altra a volta di pietra, bastante a ricettare sotto il tetto la statura del più alto homo, ma capace di poche persone. . . . Intorno nelle mura interiormente si distinguono continuati buchi di travi (the modern buchi per i falconi, dowel-holes to receive the ends of floor-joints) di mezzo carro in linea uguale. Danno a credere si sia stato un tavolato intorno per gente, che coperta da merli delle mura possa tutelare il recinto. . . . Questo luogo vien chiamato Galicinich. Corre un idiotismo (trivial legend), che due regoli fossero patroni, di Gradina, che nell'idioma illirico suona città diroccata, e di Galicinich; tra loro inimici, et in continua guerra; e vi fu chi in Galicinich egualmente credulo ad avaro sudasse per trovare tesoro nascosto."

Somewhat despairing about the other building, I walked across the slope of the Iron Mountain, about three-quarters of a mile to the west, by a path rounding the heads of two small ravines. At one sheltered spot appeared a newly-planted vineyard: in Dalmatia, as in Istria, cultivation rises high above sea-level.

Presently we came upon the Torre di Gelsa; the Slavs call it "Tor," or sheep-fold (*e.g.* ú-Tor, nell'ovile), but perhaps the latter is a mere corruption of the former. I was delighted; my rough and rainy walks had not been in vain. The site is singular; the apex of a rocky arête, utterly without water, except from rain, and apparently isolated, although large cut-stones, which may have belonged to it or to its outworks, were scattered around. The inside was filled up with earth; externally it showed from four to five isodomic lower courses of large ashlar, calcaire from the mountain on which it stood, and nowhere was there a trace of mortar. The largest parallelopipedon measured 2·06 metres (=6 feet 9 inches) by 0·76 (=2 feet 5·9 inches) in height. The angles, especially the north-eastern, showed the draught extending through the courses from the lowest to the highest. The western exterior consisted of four lower courses of large stones, capped by three modern, or, at least, smaller layers; and the emplectori, or "old English bond," popularly called "headers and stretchers," were apparently not unknown to the

builders. The stones were all boldly bossed, like those of Salona, with chiselled draughts, and the height of the projection might have been 6 to 8 inches. The magnetic meridian passed through the angles, and the slope was an oblong rather than a square. The northern side measured 7.25 metres (=23 feet 9 inches); the southern 7.14; the eastern and the western 6.66 (21 feet 10 inches).

My sketch was utterly spoilt by the deluging rain at the time of inspection; the nebulae malusque Jupiter determined to do their very worst. But my excellent host promised to send me plan, elevation, and measurements. He kept his word with truly British punctuality, and enabled me to present to my readers the sketch which accompanies these pages (Pl. xiii. figs. 3, 4). I gladly take the earliest opportunity of thanking him once more.

Professional archæologists will determine the *rapport* between this mysterious building and the Pantellarian "Sesi," which have yielded stone implements; the Nuraghi of Sardinia and the Balearic Talajot (Arab. *تالوت*, *i.e.* watch-towers). The general aspect reminded me of the garrison-stations on the Roman high-roads, especially of that near Khan Khuldeh, supposed to be the "Mutatio Heldua" of the Jerusalem Itinerary, near Bayrût, on the way to Sidon. But here there is no sign of cement. I found no traces of a highway, and the site, commanded on the southern side, and occupying the roughest of rocky ground, where enemies might everywhere lie in ambush, and where half a dozen square yards of tolerably level surface cannot be had, renders it equally unfit for a refuge place and for a settlement. It might perhaps be an outwork and a look-out commanding the sea; still there remains the curious contrast of elaborate finish with an object for which the simplest building would suffice.

Prof. Boglić appears to think (pp. 11-12) that the "Tor" was connected with certain ruins near the Gelsa townlet, which have disappeared only lately, either buried under alluvium or removed by the peasantry. He quotes Priboevo of Lesina, who, in a discourse or harangue (*De Origine et Successibus Slavorum*) pronounced (1525) before an "Academy" in his native town, describes in these words the ruins of Cittavecchia and Gelsa. I preserve the quaint contractions of the original.

"Quapp. neminē capiat admiratio, duas olim, altera ab oriente, altera ab occidente, cui' supra memin' egregios sortita port', hoc i agro urbis extitisse, ipsā ruina pristinā ear. dignitatē prodente, apparentibus ibidem pluribus magnis ædificiis, et ex pario lapide truncatis, et semicorrosis Heroum imaginib', nec non et lithostratis varias bestiar' et sydir' formas preferentibus. . . . Est et unum adhuc fere integrum inter montis oppidum urbi (*i.e.* Gelsæ) quæ orientalem agri hui' regionem obtinebat

supereminens, juxta quod ad jactum sagittæ, ex quadratis miræ magnitudinis lapidibus turris est, unicum habens angustum hostium, in qua ob antiquitatem nullum cementi vestigium apparet. Sunt et in plerisq. aliis hujus insulæ locis, humanæ habitationis vestigia, in quib' antiqui illi Pharenses vicatim habitaverunt. Ex his colligo p̄tēr primariā in qua sum' urbem, quæ a meridionali insulæ parte posita, Pharum proprie, vulgo autem (sicut Calepinus prodit) Lisna, corrupti' aut Lesina dicitur, sex in hac insula olim oppida absque villis, quæ numerosæ erant, extetissi" (sic).

Prof. Boglić (pp. 11, 12) thus describes the building:—
 "Anche una torre, che sorge da un cumulo di sassi sul monte posto a mezzogiorno di Jelsa, offre tutti i caratteri dei ruderi di Cittavecchia, soltanto i massi sono battuti più rozzamente, ed il lavoro potrebbe credersi più antico. Alcuni di questi sono alti due piedi ed otto polci Viennesi (= 2 feet 9·10 inches); lunghi cinque (= 5 ft. 2·23). Ai tempi del Priboevo nel lato di mezzodì vi era una porticina, che poscia ruinò, e non restano che soli tre lati, che varebbe la pena di meglio conservare. I pastori ne distrussero una parte, atterrando poco a poco le pietre, che sovrapposte le une alle altre senza cemento, più facilmente si potevano smuovere. I lati della torre che ancora restano, sono alti sedici piedi Viennesi circa (= 16 feet 7·12 inches); lunghi a Settentrione ventidue (= 22 ft. 9·79) diciannove (= 19 ft. 8·46) ad Occidente e Levante."

Professor Boglić wisely refuses to "evocate" the Pelasgi, because similar monuments are found in Eastern Asia, for instance, where those wandering tribes cannot, "even with the greatest indulgence," be made to emigrate. I would here remark that the Samothracian Pelasgi seem of late years to have gone out of fashion, probably on account of the highly absurd etymologies proposed for them, such as Semitic roots for an Aryan race;* and yet there is no race of which the universal voice of classical antiquity speaks with more clearness and consent. The professor holds that the Gelsa style of architecture was not peculiar to a single people, but rather that it denotes a certain stage of civilisation, of progress, evolved under ethnological conditions the most dissimilar. A nation which either cannot, or which knows not how to make the cement that con-

* For instance, Pelishti or Felishti, peregrinus, advena, from Palasha (Falasha) migravit, whence, by-the-by, the Falasha Jews of Abyssinia. Some explain the Semitism by supposing that it was applied to the Indo-Europeans by the Egypto-Phenicians; if so, had they no racial name of their own? Also from Pelasgus, the king who civilised them. From Pelargos, a crane (quod gregatim errarent); from Palasos, ancient; from Pélagus, the sea, being a maritime race; from the root of "pellere" and ex-pel. Chabas ("Études sur l'antiquité," &c., August, 1872) thinks that he finds them in the Pelestas of the Stela of Medinat Habu, recounting the conquests of Rameses, and dating from the 12th century B.C.

solidates small stones into a mass of masonry, must perforce, when building its defences, employ megaliths whose weight keeps them in place, even when exposed to the shock of battering engines. He finds this specially denoting, in Greece as well as in Italy, the epoch of incipient settled life, the first stage of civilisation. He therefore concludes that the ruins of Cittavecchia, and of the Tor di Gelsa, were the works of the later Illyrians.* These tribes were found occupying Lesina in the 4th century B.C., and in B.C. 45, according to Diodorus Siculus (xiii. 3), they inhabited "a little settlement of extraordinary strength (*ἐν τινὶ κωριῷ καθ' ὑπερβολὴν ὄχυρῳ*).

I must here join issue with the learned professor upon sundry points. Diodorus Siculus (xiii. 3) speaks distinctly of the founding (*κτίσις*) and walling of Pharia by the Parians. The walls of Cittavecchia certainly belonged to a Greek colony, as is proved by the thousand remains found within them, to say nothing of their shape, and the form which they enclosed. The Tor di Gelsa does not appear to me a ruder or a more primitive form than the defences of Pharia, although having been exposed for long ages to the violent Bora, it has been more mutilated by time and weather. And I can hardly imagine how he made away with the fourth side; it reminds me of what was said of Ireland, where—

The sly surveyors stole a shire.

Finally, the remarkable resemblance, amounting almost to identity of shape, between the two Lesina ruins and those of the "Murazzo," or long wall of Salona, the subject to which the first part of this paper was devoted, naturally suggests that all three were the work of a single people, and that people not the barbarous Illyrians, but the comparatively civilised Greeks.

A few words to the reader by way of conclusion. The late Mr. Paton, whose acquaintance I had made, and whose memory I would treat as that of a friend, wrote a useful and not unlearned book, which he called by the picturesque name, "Highlands and Islands of Dalmatia." I should be sorry if it induced the archaeologist to imagine for a moment that exploration of either feature had ever even been attempted. Whilst Greek and Roman antiquities have occupied the lives of many able men, prehistoric study is only now making itself known by name. The best proof is that at the end of 1874 only two stone implements, both found within the year, had taken their place in the little museum of progressive Spalato (Pl. xiii. figs. 1, 2).

* Prof. Boglić (pp. 9, 10) adopts the opinion of Niebuhr, that—(1) the Illyrians were a different race from the Liburnians; and that (2) the Illyrians, from whom the Skipitar (Albanians) are descended, inhabited with the Greeks the Pœonians, and the Thracians, "Pelagias," or Macedonia; but they were neither Greeks nor Pelasgi.

I need not speak of the Dalmatian highlands; but to explore the islands there is some little difficulty. The traveller will find scanty aid from steamers; he will have no roads, and he must work his way on foot through the roughest bush; he must carefully visit every height; and he must be prepared for few successes and many failures. If he cannot speak Slav, he must be accompanied by one who does, and he had better take with him plain and coloured engravings of stone implements, which will supply the want of technical language; for instance, an arrow-head or axe will be known only as *Mali kamen strella*, the little lightning-stone. He must be prepared to rough it, to live hard, not to murmur against the smaller insects, and, perhaps, to risk an attack of ague and fever. Finally, though life is not expensive, he must prepare for a considerable waste of precious time.

I had preserved, so to speak, the Dalmatian Islands as a happy hunting-ground; but official occupations, and, worse still, a serious illness, interfered with my projects. Next to exploring for oneself, the best work an explorer can do is to promote exploration in others. My highest ambition for these pages is to show how much remains to be done. A party of three or four friends, forming a committee of discovery, could hardly spend their time better than by devoting the best season of the year, from April to June included, to a careful survey of the Dalmatian Archipelago, visiting every site called *Grad*, and collecting the folk-lore which everywhere abounds. I prefer the number four, because it would obviate the delay by enabling the party to separate into two and three sections. Needless to say that all my small amount of experience would be gladly placed at the adventurers' disposal, and that they would have my best wishes for their success.

EXPLANATION OF PLATES XII. AND XIII.

Plate xii.—Plan of Salona, near Spalato, showing the Long Wall; with plan of the Amphitheatre and Cæsarian Gate.

Plate xiii.—Fig. 1. The first stone implement found in Dalmatia, now in the Museum of Spalato. Half natural size. Fig. 2. Axe of greenstone, found at Salona. Half natural size. Fig. 3. Elevation of the Tor di Gelsa, in the Island of Lesina. Fig. 4. Plan of the Tor di Gelsa.

DISCUSSION.

MR. HYDE CLARKE said that Captain Burton's paper was of the greater interest, as he had observed that in Istria and Dalmatia the ancient names were largely pre-Hellenic, and conformed to those in Etruria, Hellas, Asia Minor, and generally to the Sumerian class.

Prof. HUGHES said that Captain Burton had brought before them the results of his observations on three quite unconnected remains in different parts of the country. 1st, there were the neolithic remains on the island; 2nd, the ancient camp; and 3rd, the old walls. With regard to Captain Burton's remarks on the first, he thought that, whatever reason there might be for supposing that great changes had taken place in the physical geography of the Mediterranean area since the diminutive Maltese elephant and its contemporaries had walked from Africa to Malta and Europe, or that Palæolithic man had looked on a shore very different from what we see there now, still we have no evidence that would justify our assuming that the Adriatic islands had been cut off from the mainland since neolithic times, even though we know that along the lines of volcanic activity considerable changes of level have taken place in historic times. With regard to the second set of phenomena, it was interesting to find that in that part of Europe, as in Britain, the races which immediately preceded historic times built the same kind of camp, occupying a hill-top and throwing up irregular lines where necessary, and where the position could be most easily defended, but which had no constant size or form. Pottery, however, he thought, was an uncertain test of age when applied to the correlation of remains found in districts far apart and countries imperfectly worked out. For instance, he had seen pottery being manufactured on the northern spurs of the Pyrenees which differed in no respect from that found in caves with the remains of primæval man in the same district. He objected to Captain Burton's definition of Cyclopean and Pelasgic, pointing out that the term Pelasgic had got into disrepute among ethnologists because, if applied to everything pre-Hellenic, it was too vague for their purpose, and when limited, the limitations had been generally founded upon unwarrantable assumptions. Cyclopean was used for those ancient walls, built of stones so enormous that fancy called up giants for their construction. But there was not sufficient evidence to fix the relative age of Pelasgic and Cyclopean, or to justify such a new application of old words as that suggested.

Mr. MOGGIDGE suggested whether the object of which a model was exhibited may not have been a Muller. It closely resembles a Muller which he found in disinterring one of the most ancient churches in this island, that had long been hidden from the eye of man; so long, indeed, that when he went to work the only clue he had was that tradition said, "under that sand-hill lies the ancient church." If this be a Muller, it may indicate the nationality of those who at one time occupied the spot on which it was found.

The PRESIDENT remarked that as Captain Burton had alluded to the resemblance between the Castellieri he had spoken of and some of the hill forts, described by him (the President), in the "*Archæologia*," it might be useful to say a few words on that point. It was certainly remarkable, but by no means surprising, that such a resemblance should exist, the chief feature of which appeared to him to consist in the fact of their being situated on the tops of hills,

remote from water, security against attack being the main object sought, and implying a condition of constant warfare between tribe and tribe. A thickly overgrown, marshy, and unhealthy lowland country would also have this result. Whereas, in times corresponding to the Roman era, the encampments and other habitations were often situated in low ground, and generally near water, showing that in a higher condition of culture the interior economy, comfort, and convenience of the inhabitants were beginning to be better looked after. The casts of spear-heads exhibited by Captain Burton, the originals of which are said to be of copper, are of the kind more usually constructed of bronze, and are of what may be called the northern type; that is to say, they are leaf-shaped, with a medial rib, and provided with sockets, the whole of which is cast; corresponding in all respects to those found in England, Denmark, France, Germany, and eastward as far as Siberia, and differing essentially from those found in the island of Cyprus, from those discovered on the site of Troy by Dr. Schlieman, from some of those used in ancient Egypt, and from those found in Hindustan, in which the spear-heads are either fitted into the shafts by means of tangs on the sockets, or formed by being cast flat, and afterwards bent over the head of the shaft, leaving a longitudinal slit at the point of junction. This is a noteworthy distinction between the implements of the two regions. The fragments of pottery exhibited appear to be of at least two kinds; a fine description, corresponding to what we should in this country call Roman; and a somewhat coarser kind, containing grains of quartz, resembling what we might here term Romano-British; but there is none of the looser, ill-baked kind, which is characteristic of early British pottery. Captain Burton had been so kind as to make him a present of these casts for his collection at Bethnal Green, and he need hardly say that he regarded them as of the highest value and interest.

The author briefly replied.

Mr. Rudler read a communication from Mr. HORACE B. WOODWARD, describing a wooden image and a spear-head discovered near Newton Abbot. They were found by workmen in the employ of Messrs Watts, Blake, Bearne, and Co., clay merchants, of Newton Abbot, by which firm they were exhibited.

In digging for the pipe and potters' clay belonging to the Bovey formation, and which occupies the greater part of the valley between Bovey Tracey and Newton Abbot, there is always met with a superficial accumulation of gravel, sand, and mud, called the "Head" (and sometimes "Pengelly's Head"). This gravelly deposit has no connection with the Bovey deposit, being comparatively of very recent date; nevertheless, when looked at in a large way, and traced on the ground, it is found to extend up the hill-sides at Woolborough and Milber Down, to a height of 330 and 420 feet, and, indeed, in one place, to

a height of 540 feet. At the same time, the gravel extends towards Chudleigh, and occurs in outlying masses, which seem to connect it with the drifts on Haldon Hills, 800 feet and more above sea-level. It is necessary to mention these facts, because the valley of the Teign, near Newton, has received deposits of drift gravel which cannot be satisfactorily attributed to present river-action, and may, perhaps, be connected with the phenomena of the glacial period.

Be this as it may, there is no doubt that some of the gravels in the lower parts of the valley have been re-assorted by the present river; so that, although it may be difficult, and, in some instances, impossible, from superficial observation, to separate the gravels into those of most recent date and those of possibly glacial age, yet we must be prepared to assign a very recent origin to many of the gravels in the low grounds, and to account for rapid accumulation of gravel by the fact that it was there "ready-made," and had only to be re-assorted and re-deposited by the action of the present river, aided as well by the deposits brought down from the hills by the main stream and its tributaries, as by mud that might be brought up by the incoming tide, for tidal conditions formerly prevailed much higher than at present.

The specimens were discovered in the gravel above the clay between Newton Abbot and Kingsteignton, in a large pit by the river-side on its left bank, about a quarter of a mile north-west of the turnpike. The clay pit is called Zitherixton Pit, and is partly in the parish of Teigngrace and partly in that of Kingsteignton.

The section displayed a thickness of 25 feet of gravel, sand, and mud stratified, but varying much in detail at different parts of the pit. Towards the top the gravel was generally fine, and at the base usually very coarse. Many fragments of oak trees were met with—the heads pointing down-stream—and against them gravel was banked on the higher ends (up-stream), while mud was accumulated on the lower end. The oaken figure was found standing in a nearly upright position against one of these trees, embedded in gravel, and at a depth of 20 feet. The bronze spear-head was found at a depth of 15 feet, and numerous bones of ox, deer, &c., were met with at a depth of from 15 to 20 feet.

The image and spear-head have since been described and figured by Mr. Pengelly in the "*Transactions of the Devonshire Association*," vii. p. 200, and plate.

The level of this deposit was but 4 or 5 feet above the river-level, so that the pit was worked to some considerable extent below the water-level, and much subject to infiltration of the water. The deposit may, without doubt, be classed amongst the latest accumulations of the river, and be included with the alluvium.

JUNE 22ND, 1875.

Colonel A. LANE FOX, *President, in the Chair.*

The minutes of the previous meeting were confirmed.

FREDERIC CLAUDET, Esq., F.C.S., of 10, Oak Hill, Hampstead, was elected a member.

The following list of presents was read, and thanks were voted to the donors:—

FOR THE LIBRARY.

From the SOCIETY.—Proceedings of the Royal Geographical Society. Vol. XIX. No. 5.

From the AUTHOR.—Nirragghi Sardi and other Non-Historic Stone Structures. By Captain S. P. Oliver.

From the ANTHROPOLOGICAL SOCIETY OF SPAIN.—Revista de Antropologia.

From Captain HAROLD DILLON.—Report of Surveyor-General of Dominion Lands, December, 1874.

From JAMES BURNS, Esq.—Human Nature, for June, 1875.

From the SOCIETY.—Mittheilungen der Anthropologischen Gesellschaft in Wien.

From the ASSOCIATION.—Journal of the Royal Historical and Archaeological Association of Ireland.

From the EDITOR.—Revue Scientifique. Nos. 49, 50, and 51, 1875.

From the EDITOR.—Materiaux pour l'Histoire Primitive et Naturelle de l'Homme. Vol. VI. No. 6.

From Messrs. CHAPMAN AND HALL.—Wanderings in New Guinea. By Captain John A. Lawson.

From the EDITOR.—Nature, to date.

In the absence of the author, the following paper was read by Mr. Rudler:—

THE COMPARATIVE PSYCHOLOGY OF MAN. By HERBERT SPENCER.

WHILE discussing with two members of the Anthropological Institute the work to be undertaken by its psychological section, I made certain suggestions which they requested me to put in writing. When reminded, some months after, of the promise I had made to do this, I failed to recall the particular suggestions referred to; but in the endeavour to remember them, I was led to glance over the whole subject of comparative human psychology. Hence resulted the following paper.

That making a general survey is useful as a preliminary to deliberate study, either of a whole or of any part, scarcely needs

showing. Vagueness of thought accompanies the wandering about in a region without known bounds or landmarks. Attention devoted to some portion of a subject, in ignorance of its connection with the rest, leads to untrue conceptions. The whole cannot be rightly conceived without some knowledge of the parts; and no part can be rightly conceived out of relation to the whole.

To map out the comparative psychology of man must also conduce to the more methodic carrying on of inquiries. In this, as in other things, division of labour will facilitate progress; and that there may be division of labour, the work itself must be systematically divided.

. We may conveniently separate the entire subject into three main divisions, arranged in the order of increasing speciality.

The first division will treat of the degrees of mental evolution of different human types, generally considered: taking account of both the mass of mental manifestation and the complexity of mental manifestation. This division will include the relations of these characters to physical characters—the bodily mass and structure, and the cerebral mass and structure. It will also include inquiries concerning the time taken in completing mental evolution, and the time during which adult mental power lasts; as well as certain most general traits of mental action, such as the greater or less persistence of emotions and of intellectual processes. The connection between the general mental type and the general social type should also be here dealt with.

In the second division may be conveniently placed apart, inquiries concerning the relative mental natures of the sexes in each race. Under it will come such questions as these:—What differences of mental mass and mental complexity, if any, existing between males and females, are common to all races? Do such differences vary in degree, or in kind, or in both? Are there reasons for thinking that they are liable to change by increase or decrease? What relations do they bear in each case to the habits of life, the domestic arrangements, and the social arrangements? This division should also include in its scope the sentiments of the sexes towards one another, considered as varying quantitatively and qualitatively; as well as their respective sentiments towards offspring, similarly varying.

For the third division of inquiries may be reserved the more special mental traits distinguishing different types of men. One class of such specialities results from differences of proportion among faculties possessed in common; and another class results from the presence in some races of faculties that are

almost or quite absent from others. Each difference in each of these groups, when established by comparison, has to be studied in connection with the stage of mental evolution reached, and has to be studied in connection with the habits of life and the social development, regarding it as related to these both as cause and consequence.

Such being the outlines of these several divisions, let us now consider in detail the subdivisions contained within each.

I.—Under the head of general mental evolution we may begin with the trait of—

1. *Mental mass*.—Daily experiences show us that human beings differ in volume of mental manifestation. Some there are whose intelligence, high though it may be, produces little impression on those around; while there are some who, when uttering even commonplaces, do it so as to affect listeners in a disproportionate degree. Comparison of two such makes it manifest that, generally, the difference is due to the natural language of the emotions. Behind the intellectual quickness of the one there is not felt any power of character; while the other betrays a momentum capable of bearing down opposition—a potentiality of emotion that has something formidable about it. Obviously the varieties of mankind differ much in respect of this trait. Apart from kind of feeling, they are unlike in amount of feeling. The dominant races overrun the inferior races mainly in virtue of the greater quantity of energy in which this greater mental mass shows itself. Hence a series of inquiries, of which these are some:—(a) What is the relation between mental mass and bodily mass? Manifestly, the small races are deficient in it. But it also appears that races much upon a par in size—as, for instance, an Englishman and a Damara, differ considerably in mental mass. (b) What is its relation to mass of brain? and, bearing in mind the general law that in the same species, size of brain increases with size of body (though not in the same proportion), how far can we connect the extra mental mass of the higher races, with an extra mass of brain beyond that which is proper to their greater bodily mass? (c) What relation, if any, is there between mental mass and the physiological state expressed in vigour of circulation and richness of blood, as severally determined by mode of life and general nutrition? (d) What are the relations of this trait to the social state, as predatory or industrial, nomadic or agricultural?

2. *Mental complexity*.—How races differ in respect of the more or less involved structures of their minds, will best be understood on recalling that unlikeness between the juvenile mind

and the adult mind among ourselves, which so well typifies the unlikeness between the minds of savage and civilized. In the child we see absorption in special facts. Generalities even of a low order are scarcely recognized; and there is no recognition of high generalities. We see interest in individuals, in personal adventures, in domestic affairs; but no interest in political or social matters. We see vanity about clothes and small achievements; but little sense of justice: witness the forcible appropriation of one another's toys. While there have come into play many of the simpler mental powers, there has not yet been reached that complication of mind which results from the addition of powers evolved out of these simpler ones. Kindred differences of complexity exist between the minds of lower and higher races; and comparisons should be made to ascertain their kinds and amounts. Here, too, there may be a subdivision of the inquiries. (a) What is the relation between mental complexity and mental mass? Do not the two habitually vary together? (b) What is the relation to the social state, as more or less complex?—that is to say, Do not mental complexity and social complexity act and react on each other?

3. *Rate of mental development.*—In conformity with the biological law, that the higher the organisms the longer they take to evolve, members of the inferior human races may be expected to complete their mental evolution sooner than members of the superior races; and we have evidence that they do this. Travelers from all regions comment, now on the great precocity of children among savage and semi-civilized peoples, and now on the early arrest of their mental progress. Though we scarcely need more proofs that this general contrast exists, there remains to be asked the question, whether it is consistently maintained throughout all orders of races, from the lowest to the highest—whether, say, the Australian differs in this respect from the Hindu, as much as the Hindu does from the European. Of secondary inquiries coming under this sub-head may be named several. (a) Is this more rapid evolution and earlier arrest always unequally shown by the two sexes; or, in other words, are there in lower types proportional differences in rate and degree of development, such as higher types show us? (b) Is there in many cases, as there appears to be in some cases, a traceable relation between the period of arrest and the period of puberty? (c) Is mental decay earlier in proportion as mental evolution is rapid? (d) Can we in other respects assert that where the type is low, the entire cycle of mental changes between birth and death—ascending, uniform, descending—comes within a shorter interval?

4. *Relative plasticity.*—Is there any relation between the

degree of mental modifiability which remains in adult life, and the character of the mental evolution in respect of mass, complexity, and rapidity? The animal kingdom at large yields us reasons for associating an inferior and more rapidly-completed mental type, with a relatively automatic nature. Lowly organized creatures, guided almost entirely by reflex actions, are in but small degrees changeable by individual experiences. As the nervous structure complicates, its actions become less rigorously confined within pre-established limits; and as we approach the highest creatures, individual experiences take larger and larger shares in moulding the conduct: there is an increasing ability to take in new impressions and to profit by the acquisitions. Inferior and superior human races are contrasted in this respect. Many travellers comment on the unchangeable habits of savages. The semi-civilized nations of the East, past and present, were, or are, characterized by a greater rigidity of custom than characterizes the more civilized nations of the West. The histories of the most civilized nations show us that in their earlier times the modifiability of ideas and habits was less than it is at present. And if we contrast classes or individuals around us, we see that the most developed in mind are the most plastic. To inquiries respecting this trait of comparative plasticity, in its relations to precocity and early completion of mental development, may be fitly added inquiries respecting its relations to the social state, which it helps to determine, and which reacts upon it.

5. *Variability.*—To say of a mental nature that its actions are extremely inconstant, and at the same time to say that it is a relatively unchangeable nature, apparently implies a contradiction. When, however, the inconstancy is understood as referring to the manifestations which follow one another from minute to minute, and the unchangeableness to the average manifestations, extending over long periods, the apparent contradiction disappears; and it becomes comprehensible that the two traits may, and ordinarily do, co-exist. An infant, quickly weary with each kind of perception, wanting ever a new object, which it soon abandons for something else, and alternating a score times a day between smiles and tears, shows us a very small persistence in each kind of mental action: all its states, intellectual and emotional, are transient. Yet at the same time its mind cannot be easily changed in character. True, it changes spontaneously in due course; but it long remains incapable of receiving ideas or emotions beyond those of simple orders. The child exhibits less rapid variations, intellectual and emotional, while its educability is greater. Inferior human races show us this combination: great rigidity of general character with great irregularity in its passing manifestations. Speaking broadly,

while they resist permanent modification they lack intellectual persistence, and they lack emotional persistence. Of various low types we read that they cannot keep the attention fixed beyond a few minutes on anything requiring thought, even of a simple kind. Similarly with their feelings: these are less enduring than those of civilized men. There are, however, qualifications to be made in this statement; and comparisons are needed to ascertain how far these qualifications go. The savage shows great persistence in the action of the lower intellectual faculties. He is untiring in minute observation. He is untiring, also, in that kind of perceptive activity which accompanies the making of his weapons and ornaments: often persevering for immense periods in carving stones, &c. Emotionally, too, he shows persistence not only in the motives prompting these small industries, but also in certain of his passions—especially in that of revenge. Hence, in studying the degrees of mental variability shown us in the daily lives of the different races, we must ask how far variability characterizes the whole mind, and how far it holds only of parts of the mind.

6. *Impulsiveness*.—This trait is closely allied with the last: unenduring emotions are emotions which sway the conduct now this way and now that, without any consistency. The trait of impulsiveness may, however, be fitly dealt with separately, because it has other implications than mere lack of persistence. Comparisons of the lower human races with the higher, appear generally to show that, along with brevity of the passions, there goes violence. The sudden gusts of feeling which men of inferior types display, are excessive in degree as they are short in duration; and there is probably a connection between these two traits: intensity sooner producing exhaustion. Observing that the passions of childhood illustrate this connection, let us turn to certain interesting questions concerning the decrease of impulsiveness which accompanies advance in evolution. The nervous processes of an impulsive being, are less remote from reflex actions than are those of an unimpulsive being. In reflex actions we see a simple stimulus passing suddenly into movement: little or no control being exercised by other parts of the nervous system. As we ascend to higher actions, guided by more and more complicated combinations of stimuli, there is not the same instantaneous discharge in simple motions; but there is a comparatively deliberate and more variable adjustment of compound motions, duly restrained and proportioned. It is thus with the passions and sentiments in the less developed natures and in the more developed natures. Where there is but little emotional complexity, an emotion, when excited by some occurrence, explodes in action before the other emotions have been

called into play; and each of these, from time to time, does the like. But the more complex emotional structure is one in which these simpler emotions are so co-ordinated that they do not act independently. Before excitement of any one has had time to cause action, some excitement has been communicated to others—often antagonistic ones—and the conduct becomes modified in adjustment to the combined dictates. Hence results a decreased impulsiveness, and also a greater persistence. The conduct pursued, being prompted by several emotions co-operating in degrees which do not exhaust them, acquires a greater continuity; and while spasmodic force becomes less conspicuous, there is an increase in the total energy. Examining the facts from this point of view, there are sundry questions of interest to be put respecting the different races of men. (a) To what other traits than degree of mental evolution is impulsiveness related? Apart from difference in elevation of type, the New-World races seem to be less impulsive than the Old-World races. Is this due to constitutional apathy? Can there be traced (other things equal) a relation between physical vivacity and mental impulsiveness? (b) What connection is there between this trait and the social state? Clearly a very explosive nature—such as that of the Bushman—is unfit for social union; and, commonly, social union, when by any means established, checks impulsiveness. (c) What respective shares in checking impulsiveness are taken by the feelings which the social state fosters—such as the fear of surrounding individuals, the instinct of sociality, the desire to accumulate property, the sympathetic feelings, the sentiment of justice? These, which require a social environment for their development, all of them involve imaginations of consequences more or less distant; and thus imply checks upon the promptings of the simpler passions. Hence arise the questions—In what order, in what degrees, and in what combinations, do they come into play?

7. One further general inquiry of a different kind may be added. What effect is produced on mental nature by mixture of races? There is reason for believing that throughout the animal kingdom, the union of varieties that have become widely divergent is physically injurious; while the union of slightly divergent varieties is physically beneficial. Does the like hold with the mental nature? Some facts seem to show that mixture of human races extremely unlike produces a worthless type of mind—a mind fitted neither for the kind of life led by the higher of the two races, nor for that led by the lower—a mind out of adjustment to all conditions of life. Contrariwise, we find that peoples of the same stock, slightly differentiated by lives carried on in unlike circumstances for many generations, produce by mixture a mental type having certain superiorities.

In his work on *The Huguenots*, Mr. Smiles points out how large a number of distinguished men among us have descended from Flemish and French refugees; and M. Alphonse De Candolle, in his *Histoire des Sciences et des Savants depuis deux Siècles*, shows that the descendants of French refugees in Switzerland have produced an unusually great proportion of scientific men. Though, in part, this result may be ascribed to the original natures of such refugees, who must have had that independence which is a chief factor in originality, yet it is probably in part due to mixture of races. For thinking this, we have evidence which is not open to two interpretations. Professor Morley draws attention to the fact that, during seven hundred years of our early history, "the best genius of England sprang up on the line of country in which Celts and Anglo-Saxons came together." In like manner, Mr. Galton, in his *English Men of Science*, shows that in recent days these have mostly come from an inland region, running generally from north to south, which we may reasonably presume contains more mixed blood than do the regions east and west of it. Such a result seems probable *a priori*. Two natures respectively adapted to slightly unlike sets of social conditions, may be expected by their union to produce a nature somewhat more plastic than either—a nature more impressible by the new circumstances of advancing social life, and therefore more likely to originate new ideas and display modified sentiments. The comparative psychology of man may, then, fitly include the mental effects of mixture; and among derivative inquiries we may ask—How far the conquest of race by race has been instrumental in advancing civilization by aiding mixture, as well as in other ways?

II.—The second of the three leading divisions named at the outset is less extensive. Still, concerning the relative mental natures of the sexes in each race, questions of much interest and importance may be raised.

1. *Degree of difference between the sexes.*—It is an established fact that, physically considered, the contrast between males and females is not equally great in all types of mankind. The bearded races, for instance, show us a greater unlikeness between the two than do the beardless races. Among South American tribes, men and women have a greater general resemblance in form, &c., than is usual elsewhere. The question, then, suggests itself, Do the mental natures of the sexes differ in a constant or in a variable degree? The difference is unlikely to be a constant one; and, looking for variation, we may ask what is its amount, and under what conditions does it occur?

2. *Difference in mass and in complexity.*—The comparisons

between the sexes, of course, admit of subdivisions parallel to those made in the comparisons between the races. Relative mental mass and relative mental complexity have chiefly to be observed. Assuming that the great inequality in the cost of reproduction to the two sexes is the cause of unlikeness in mental mass, as in physical mass, this difference may be studied in connection with reproductive differences presented by the various races, in respect of the ages at which reproduction commences, and the periods over which it lasts. An allied inquiry may be joined with this; namely, how far the mental developments of the two sexes are affected by their relative habits in respect to food and physical exertion? In many of the lower races, the women, treated with great brutality, are, physically, very inferior to the men: excess of labour and defect of nutrition being apparently the combined causes. Is any arrest of mental development simultaneously caused?

3. *Variation of the differences.*—If the unlikeness, physical and mental, of the sexes is not constant, then, supposing all races have diverged from one original stock, it follows that there must have been transmission of accumulated differences to those of the same sex in posterity. If, for instance, the pre-historic type of man was beardless, then the production of a bearded variety implies that within that variety the males continued to transmit an increasing amount of beard to descendants of the same sex. This limitation of heredity by sex, shown us in multitudinous ways throughout the animal kingdom, probably applies to the cerebral structures as much as to other structures. Hence the question—Do not the mental natures of the sexes in alien types of Man diverge in unlike ways and degrees?

4. *Causes of the differences.*—Is any relation to be traced between this variable difference and the variable parts the sexes play in the business of life? Assuming the cumulative effects of habit on function and structure, as well as the limitation of heredity by sex, it is to be expected that if, in any society, the activities of one sex, generation after generation, differ from those of the other, there will arise sexual adaptations of mind. Some instances in illustration may be named. Among the Africans of Loango and other districts, as also among some of the Indian Hill-tribes, the men and women are strongly contrasted as respectively inert and energetic: the industry of the women having apparently become so natural to them that no coercion is needed. Of course, such facts suggest an extensive series of questions. Limitation of heredity by sex may account both for those sexual differences of mind which distinguish men and women in all races, and for those which distinguish them in each race, or each society. An interesting subordinate

inquiry may be, how far such mental differences are inverted in cases where there is inversion of social and domestic relations; as among those Khasi Hill-tribes whose women have so far the upper hand that they turn off their husbands in a summary way if they displease them.

5. *Mental modifiability in the two sexes.*—Along with comparisons of races in respect of mental plasticity may go parallel comparisons of the sexes in each race. Is it true always, as it appears to be generally true, that women are less modifiable than men? The relative conservatism of women—their greater adhesion to established ideas and practices—is manifest in many civilized and semi-civilized societies. Is it so among the uncivilized? A curious instance of greater adhesion to custom by women than by men is given by Dalton, as occurring among the Juangs, one of the lowest wild tribes of Bengal. Until recently the only dress of both sexes was something less than that which the Hebrew legend gives to Adam and Eve. Years ago the men were led to adopt a cloth bandage round the loins, in place of the bunch of leaves; but the women adhered to the aboriginal habit: a conservatism shown where it might have been least expected.

6. *The sexual sentiment.*—Results of value may be looked for from comparisons of races made to determine the amounts and characters of the higher feelings to which the relation of the sexes gives rise. The lowest varieties of mankind have but small endowments of these feelings. Among varieties of higher types, such as the Malayo-Polynesians, these feelings seem considerably developed: the Dyaks, for instance, sometimes display them in great strength. Speaking generally, they appear to become stronger with the advance of civilization. Several subordinate inquiries may be named. (a) How far is development of the sexual sentiment dependent upon intellectual advance—upon growth of imaginative power? (b) How far is it related to emotional advance; and especially to evolution of those emotions which originate from sympathy? What are its relations to polyandry and polygyny? (c) Does it not tend towards, and is it not fostered by, monogamy? (d) What connection has it with maintenance of the family bond, and the consequent better rearing of children?

III.—Under the third head, to which we may now pass, come the more special traits of the different races.

1. *Imitateness.*—One of the characteristics in which the lower types of men show us a smaller departure from reflex action than do the higher types, is their strong tendency to mimic the motions and sounds made by others—an almost in-

voluntary habit which travellers find it difficult to check. This meaningless repetition, which seems to imply that the idea of an observed action cannot be framed in the mind of the observer without tending forthwith to discharge itself in the action conceived (and every ideal action is a nascent form of the consciousness accompanying performance of such action), evidently diverges but little from the automatic; and decrease of it is to be expected along with increase of self-regulating power. This trait of automatic mimicry is evidently allied with that less automatic mimicry which shows itself in greater persistence of customs. For customs adopted by each generation from the last, without thought or inquiry, imply a tendency to imitate which overmasters critical and sceptical tendencies: so maintaining habits for which no reason can be given. The decrease of this irrational mimicry, strongest in the lowest savage and feeblest in the highest of the civilized, should be studied along with the successively higher stages of social life, as being at once an aid and a hindrance to civilization: an aid in so far as it gives that fixity to the social organization without which a society cannot survive; a hindrance in so far as it offers resistance to changes of social organization that have become desirable.

2. *Incuriosity*.—Projecting our own natures into the circumstances of the savage, we imagine ourselves as marvel-ling greatly on first seeing the products and appliances of civilized life. But we err in supposing that the savage has feelings such as we should have in his place. Want of rational curiosity respecting these incomprehensible novelties, is a trait remarked of the lowest races wherever found; and the partially-civilized races are distinguished from them as exhibiting rational curiosity. The relation of this trait to the intellectual nature, to the emotional nature, and to the social state, should be studied.

3. *Quality of thought*.—Under this vague head may be placed many sets of inquiries, each of them extensive—(a) The degree of generality of the ideas; (b) the degree of abstractness of the ideas; (c) the degree of definiteness of the ideas; (d) the degree of coherence of the ideas; (e) the extent to which there have been developed such notions as those of *class*, of *cause*, of *uniformity*, of *law*, of *truth*. Many conceptions which have become so familiar to us that we assume them to be the common property of all minds, are no more possessed by the lowest savages than they are by our own children; and comparisons of types should be so made as to elucidate the processes by which such conceptions are reached. The development under each head has to be observed—(a) independently in its

successive stages; (*b*) in connection with the co-operative intellectual conceptions; (*c*) in connection with the progress of language, of the arts, and of social organization. Already linguistic phenomena have been used in aid of such inquiries; and more systematic use of them should be made. Not only the number of general words, and the number of abstract words, in a people's vocabulary should be taken as evidence, but also their *degrees* of generality and abstractness; for there are generalities of the first, second, third, &c., orders and abstractions similarly ascending in degree. *Blue* is an abstraction referring to one class of impressions derived from visible objects; *colour* is a higher abstraction referring to many such classes of visual impressions; *property* is a still higher abstraction referring to classes of impressions received not through the eyes alone, but through other sense-organs. If generalities and abstractions were arranged in the order of their extensiveness and in their grades, tests would be obtained which, applied to the vocabularies of the uncivilized, would yield definite evidence of the intellectual stages reached.

4. *Peculiar aptitudes*.—To such specialities of intelligence as mark different degrees of evolution, have to be added the minor ones related to modes of life: the kinds and degrees of faculty which have become organized in adaptation to daily habits—skill in the use of weapons, powers of tracking, quick discrimination of individual objects. And under this head may fitly come inquiries concerning some race-peculiarities of the æsthetic class, not at present explicable. While the remains from the Dordogne caves show us that their inhabitants, low as we must suppose them to have been, could represent animals, both by drawing and carving, with some degree of fidelity; there are existing races, probably higher in other respects, who seem scarcely capable of recognizing pictorial representations. Similarly with the musical faculty. Almost or quite wanting in some inferior races, we find it in other races, not of high grade, developed to an unexpected degree: instance the Negroes, some of whom are so innately musical, that, as I have been told by a missionary among them, the children in native schools, when taught European psalm-tunes, spontaneously sing seconds to them. Whether any causes can be discovered for race-peculiarities of this kind, is a question of interest.

5. *Specialities of emotional nature*.—These are worthy of careful study, as being intimately related to social phenomena—to the possibility of social progress, and to the nature of the social structure. Of those to be chiefly noted there are—(*a*) Gregariousness or sociality—a trait in the strength of which races differ widely: some, as the Mantras, being almost indifferent to

social intercourse; others being unable to dispense with it. Obviously the degree of the desire for the presence of fellow-men, affects greatly the formation of social groups, and consequently underlies social progress. (b) Intolerance of restraint. Men of some inferior types, as the Mapuché, are ungovernable; while those of other types, no higher in grade, not only submit to restraint, but admire the persons exercising it. These contrasted traits have to be observed in connection with social evolution; to the early stages of which they are respectively antagonistic and favourable. (c) The desire for praise is a trait which, common to all races, high and low, varies considerably in degree. There are quite inferior races, as some of those in the Pacific States, whose members sacrifice without stint to gain the applause which lavish generosity brings; while, elsewhere, applause is sought with less eagerness. Notice should be taken of the connection between this love of approbation and the social restraints; since it plays an important part in the maintenance of them. (d) The acquisitive propensity. This, too, is a trait the various degrees of which, and the relations of which to the social state, have to be especially noted. The desire for property grows along with the possibility of gratifying it; and this, extremely small among the lowest men, increases as social development goes on. With the advance from tribal property to family property and individual property, the notion of private right of possession gains definiteness, and the love of acquisition strengthens. Each step towards an orderly social state, makes larger accumulations possible, and the pleasures achievable by them more sure; while the resulting encouragement to accumulate, leads to increase of capital and further progress. This action and re-action of the sentiment and the social state, should be in every case observed.

6. *The altruistic sentiments.*—Coming last, these are also highest. The evolution of them in the course of civilization shows us very clearly the reciprocal influences of the social unit and the social organism. On the one hand, there can be no sympathy, nor any of the sentiments which sympathy generates, unless there are fellow-beings around. On the other hand, maintenance of union with fellow-beings depends in part on the presence of sympathy, and the resulting restraints on conduct. Gregariousness or sociality favours the growth of sympathy; increased sympathy conduces to closer sociality and a more stable social state; and so, continuously, each increment of the one makes possible a further increment of the other. Comparisons of the altruistic sentiments resulting from sympathy, as exhibited in different types of men and different social states, may be conveniently arranged under three heads—(a) Pity, which should

be observed as displayed towards offspring, towards the sick and aged, and towards enemies. (*b*) Generosity (duly discriminated from the love of display) as shown in giving; as shown in the relinquishment of pleasures for the sake of others; as shown by active efforts on others' behalf. The manifestations of this sentiment, too, are to be noted in respect of their range—whether they are limited to relatives; whether they extend only to those of the same society; whether they extend to those of other societies; and they are also to be noted in connection with the degree of providence—whether they result from sudden impulses obeyed without counting the cost, or go along with a clear foresight of the future sacrifices entailed. (*c*) Justice. This most abstract of the altruistic sentiments is to be considered under aspects like those just named, as well as under many other aspects—how far it is shown in regard to the lives of others; how far in regard to their property; how far in regard to their various minor claims. And the comparisons of men in respect of this highest sentiment should, beyond all others, be carried on along with observations on the accompanying social state, which it largely determines—the form and actions of government; the character of the laws; the relations of classes.

Such, stated as briefly as consists with clearness, are the leading divisions and subdivisions under which the Comparative Psychology of Man may be arranged. In going rapidly over so wide a field, I have doubtless overlooked much that should be included. Doubtless, too, various of the inquiries named will branch out into subordinate inquiries well worth pursuing. Even as it is, however, the programme is extensive enough to occupy numerous investigators, who may with advantage take separate divisions.

Though, after occupying themselves with primitive arts and products, anthropologists have devoted their attention mainly to the physical characters of the human races; it must, I think, be admitted that the study of these yields in importance to the study of their psychological characters. The general conclusions to which the first set of inquiries may lead, cannot so much affect our views respecting the highest classes of phenomena as can the general conclusions to which the second set may lead. A true theory of the human mind vitally concerns us; and systematic comparisons of human minds, differing in their kinds and grades, will help us in forming a true theory. Knowledge of the reciprocal relations between the characters of men and the characters of the societies they form, must influence profoundly our ideas of political arrangements. When the interdependence of individual nature and social structure is understood, our con-

ceptions of the changes now taking place, and hereafter to take place, will be rectified. A comprehension of mental development as a process of adaptation to social conditions, which are continually remoulding the mind, and are again remoulded by it, will conduce to a salutary consciousness of the remoter effects produced by institutions upon character; and will check the grave mischiefs which ignorant legislation now causes. Lastly, a right theory of mental evolution as exhibited by humanity at large, giving a key, as it does, to the evolution of the individual mind, must help to rationalize our perverse methods of education; and so to raise intellectual power and moral nature.

DISCUSSION.

MR. HYDE CLARKE said that the council had always been most desirous of promoting the study of psychology, and, on his proposition, had instituted a section, of which he had been named chairman. Although he had prepared an address, its delivery had been delayed, and he was glad Mr. Spencer had come forward and accomplished the task so ably. Mr. Spencer concurred with him in the adoption of the term "comparative psychology." At the same time, he (the speaker) had intended thereby to promote the study of the phenomena of animals, which sometimes gave safer opportunities for observation. While acknowledging the wide appreciation of the subject displayed by Mr. Spencer, it might be thought to tend rather to sociology than to psychology. Much delay had been caused in the development of the section by the desire of some persons to employ it chiefly for what was called spiritualism and mesmerism, but which did not receive the assent of the majority of the men of science on the council.

MR. MONCURE CONWAY said that the very valuable paper to which they had listened contained many seeds of thought, and, indeed, was for the most part expressed in the form of inquiries. In some instances Mr. Spencer had indicated positive views on novel points, and among these one appeared to require further investigation—namely, the opinion that women are more conservative than men. Mr. Conway suspected that in coming to this conclusion some men have made a mistake parallel to one against which Mr. Spencer has wisely warned us in his paper, that of expecting savages to look upon the works of civilisation with the same admiration as we should feel if beholding them for the first time. Men are liable to estimate the conservatism of women in exclusive relation to spheres of interest and action which belong to men alone, and into which women are not admitted with any large degree of freedom. Women have not the training and knowledge in those governmental and philosophical matters which we usually think of when we speak of conservatism to inspire them with the interest and courage required for progressive movement. But if we consider women in the domain of their own interest and enlightenment,

he (Mr. Conway) believed they would not be found more conservative than men. In the home, in family government, any remnant of the hard patriarchal or feudal idea is more generally represented by the father: the mother is more apt to mediate in the interest of newer and more liberal ideas of discipline and of household freedom.

Mr. SAUNDERS, while eulogising the philosophical author and his paper, contended that in bringing so wide a field of materialistic research within the limits of comparative psychology, the author should not be considered as having assigned to that branch of science the bounds which he would ultimately give to it in a general scheme of human knowledge. The paper seemed to point to the correlations of psychology with other subjects rather than to its special limitations. Indeed, it seemed to be much easier to exhibit the connections of distinct branches of science with each other than to assign their limits. Comparative psychology should define the characteristic differences of thought which distinguish one psychological group of mankind from another. This is a subtle study of itself, besides beset with linguistic difficulties. It is chiefly concerned in detecting the ruling ideas and motives, in regard to which material forms and conditions may be quite accidental.

Mr. MOGERIDGE observed that, speaking with diffidence in the presence of those who were so much better informed than himself, he believed that he was correct in saying that the highest forms of intelligence were not due to the increased magnitude of the mass of brain, but to the greater number of its convolutions. It is so with the whole animal creation. In the lowest creatures that may lay claim to brain it appears in the shape of a thread of grey matter; its intellect just enables it to live. He need not take up time by showing how the increase of intellectual power follows; firstly, the massing of the brain; secondly—and that was the point at which he would arrive—the increasing number of its convolutions. Thus the greater the multiplicity of those foldings, the larger is the amount of intellect. He would therefore ask, whether the same rule obtains in the different races of mankind?—whether, *e.g.*, the brain of the African bushman has fewer convolutions than that of the European?

Prof. ROLLESTON, Prof. BUSK, Mr. LUKE BURKE, Mr. HARRISON, and the PRESIDENT also joined in the discussion.

The author read a paper as follows:—

On the NATIVES of CENTRAL and WESTERN AUSTRALIA.
By JOHN FORREST, F.R.G.S.

It is with much pleasure I accede to the request of the President of this Institute to give a short account of habits and manners of the aboriginals of Central Australia; and although it is not a very complete account, I trust it will be found gene-

rally correct. I have had good opportunities for observing, having been three times in command of exploring expeditions, and twice crossed from Western to South Australia.

The natives of the interior of Australia are a very peculiar, though in their own way a very intelligent people; this is seen and known as civilisation forces its way, little by little, and takes possession of their haunts, and in a very short time they become very useful to the pioneer settlers. The natives of Western Australia are divided into tribes, which bear certain names; there are several, but they all merge into two great tribes, called the "Tornderup" and the "Ballarook." Wherever a native goes, so long as he does not go beyond the limit of these tribes, he will always be protected by his own tribe, although he may be a perfect stranger to them; in fact they look upon him as a brother.

The marriage laws are also very strict. A Tornderup must not marry a Tornderup, although she may be quite a stranger; if he wants a wife he must take a "Ballarook." Sometimes they break through this rule, and generally get speared or killed for their pains. They are constantly quarrelling about their wives, and running away with one another's wives is very common. The poor women generally get the worst of it, being often speared, and even sometimes killed. Still, even this severe punishment does not deter them, and it is just as common now as it was forty years ago. Betrothal is very general. A child a year old will sometimes be betrothed to an old man, and it will be his duty to protect and feed her, and (unless she is stolen by some one else) when she is old enough she becomes his wife. In the case of a husband's death his wife belongs to the oldest man of his family, who either takes her himself or gives her to some one else. There is no marriage ceremony merely handing over the woman to the man. Children always take after the mother's tribe. If a mother is "Tornderup" the child is "Tornderup," and so on.

In their natural state they never wash themselves, but in hot weather (if there are any rivers) often bathe to keep themselves cool. They grease and cover themselves with ochre (which they call "nilgie") to keep away the flies, and also to adorn themselves. Grease and dirt no doubt keep out the cold in winter, although I never heard of their knowing it. Tattooing and marking themselves on the shoulder, back, and breast are very common, indeed almost universal amongst them; boring their noses also is quite a ceremony with them, and once a year hundreds gather together in order to bore the noses of the younger men, and also to cut one another's hair.

The rite of circumcision is also universal with all I have met,

except those belonging to the south-west corner of Australia; it is a sort of religious ceremony with them. They gather together in large numbers, and the men and women part for a fortnight or more, and are not expected to see one another; if they accidentally meet they run for their lives. All the natives of the interior of Australia are entirely without clothing. Men, women, and children have no idea of wearing clothing, and are as naked as the day they were born. They pass very restless nights on account of the cold, and are continually getting up to make up the fire. They sleep in a row, with a fire on each side of them. They first make a little hollow in the ground, put some warm ashes into it, and lie down. In very wet weather they build huts of wood and thatch them with grass (I only refer to the natives of the interior, as those on the coast make first-rate huts). They might easily make rugs from the kangaroo and wallaby skins, but they never do.

I believe they have a sort of belief in a supreme being, but they cannot tell you much about it. In the south-west corner of Australia the name for father and mother is the same as for God and Son; for instance, *mammon* means father, or the supreme ruler of all, and *gnengham* means mother and also the son. Amongst all the aborigines there are wise men or doctors, called by some tribes "boolya," or that they have the "boolya" or spirit. If anyone is ill these doctors perform on them in the following manner: They find out the place that is affected and then rub and press it, and pretend to take hold of something and put it into themselves, then give a shout, and continue this for some time, and give extraordinary reasons for the illness, which are believed by all.

If a native has a bad leg, or even heart disease, and if he is getting better, the doctor will often produce a polished point of a spear that he has miraculously taken out, and he will be believed; but the strange part is, that should this doctor be taken ill himself he will at once send for another, and as thoroughly believe in his powers. Even after they become civilised they have a belief in these customs, and always avail themselves of them.

Almost everything in the Australian bush is good to eat, and the natives eat anything and everything. Kangaroo, emu, wallabies and other rats, snakes, guanas, mice, grubs, birds, roots, seeds, and many other things are collected and eaten; they live from hand to mouth, never collect more than enough for the day, and each morning have to look out for their day's food. In wet weather they go often a day or two without food, as they do not like hunting in the wet. It cannot be very comfortable going about in wet weather in your naked skin.

They have many clever ways of catching and procuring their food. The kangaroo is generally speared and sometimes run down, especially in wet weather when the ground is boggy. The emu (unlike the kangaroo and all marsupial animals) must have water regularly, and is generally killed by waiting at the water and spearing it then, or even sometimes by a man getting so close to where they know it will water as to catch hold of one of its legs and to strike it on the head with a club. In like manner, whether it is killing a kangaroo or emu, or getting opossums out of trees, they are great experts at securing their food, and are up to every possible contrivance.

They are full of superstitions, and it is impossible to make them disbelieve them. They have a belief in a soul or spirit, for when they kill one another they believe the soul or "cainga" follows the murderer at night and that he can hear it call. They also believe in a devil or evil spirit, and are afraid to go about in the dark. Some have assured me that they have seen the devil. When anyone is ill the evil spirit is the cause, and the doctor runs round and round the sick man, shouting for hours in order to keep away the devil. They do not believe in natural death, at least they think some other native has been immediately the cause, and they generally kill him for it; if he should by chance hear he is suspected he flies for his life to a distant part, and remains away a long time.

Cannibalism is common among the natives of the interior. I myself have found a skull all charred at a native's fire, and there are instances of their eating even white children. I recollect a white child being killed and eaten, and it was not until eight years after that it was discovered what became of it, and the native was hung. I have often wondered what they did (in the interior) with their dead; in all my travels I have only seen the graves of two; it is a question whether they do not often eat them. The natives have told me that it is often done.

The women are nearly slaves, having to do most of the hard work, such as making huts, carrying wood, and also carrying all the baggage, which includes many weapons, grease, "wilgie," and a host of articles, wooden dishes, &c., besides often a child. They carry these things in net bags, making the string from the inner bark of a tree. The man does not generally carry much, except his spears, &c. The spears are often difficult to procure in places where there is only low acacia scrub; they then get a pithy reed and splice a hard piece on to each end, which makes a very good spear.

Dancing is very general, called "corroberrying" in some parts; there are many different kinds of dances in which women often take part. The men are all painted and plumed for the

occasion, and (in the interior) it is the worst time to approach their camps, as they are in large numbers and generally war-like. After a dance they generally finish up with a fight, and often kill a few of each other. Singing also is very general, and different chants are taught from one tribe to another, and it is astonishing how far they travel. The songs generally have no meaning, only a few words that run well together and are repeated over and over again. Some of their songs have been set to music, and sound very well. It is very pretty to hear twenty or thirty singing together, and they have a very correct idea of keeping time.

They have great power of observation, and it is almost marvellous their knowledge of one another's tracks; by looking at a track they can tell which of their friends has gone along. They are very useful as police assistants, and it is almost impossible for a prisoner to escape from them. Water is very scarce in the interior of Australia, and they are very careful in preserving it—and while on this head, I may mention a strange formation in Australia, viz. the "rock water-hole." This is a natural cavity in a rock which catches the rain-water, and is sometimes very large and more often very small. They are the chief watering-places of the natives, and are all known and camped at, even if the cavity holds only a gallon; but the strange thing is that these cavities or receptacles are only found in country which is destitute of rivers, and very few springs.

If you are in a country abounding with rivers and springs you never, or at least scarcely ever, find the rock water-hole, although there are plenty of rocks and likely places for the receptacles; on the other hand, if you are in a country where there are no springs or rivers, every piece of rising rocky ground has these receptacles. They are in the granite, in the limestone all along the Australian bight, and in the desert sandstone of Central Australia, and are peculiar in Australia to a badly watered country. The rock water-holes are very carefully preserved by the natives, by putting stones in and over them, and also covering them with bushes to keep the water from evaporating.

Water is also procured from the hollow eucalyptus trees; also very commonly from the roots of trees. They select the proper roots, break them in pieces and stand them on end in a wooden dish, which catches all the water that is in them. By this means they often travel far away from any permanent water.

The knowledge of arts of the aborigines of Australia, as far as I have observed, is confined to weapons and contrivances to procure subsistence.

The spear is universal, and is pointed in a variety of ways; sometimes barbed at the point, the barb being spliced on; at other times notched; but nearly all have some kind of barb, and are all thrown with a "wommara," which is retained in the hand while the spear is thrown.

Another weapon is the dowak, which is a heavy stick pointed at one end and with a piece of flint gummed on the other, which is used as a small axe. It is thrown very swiftly and is very dangerous.

The boomerang or kylee is used for warfare or for amusement, and also to kill birds when they go in flocks. This weapon requires to be made very true, in order to make it revolve well in the air and to return to the thrower.

Shields are also very common, and must take a great deal of time and patience to make without chisel or knife and with only a sharp stone. The front of the shield is grooved; on the back is a handle, generally tied on, but sometimes they are all of one piece.

Nets are also made, and used in the interior for snaring small game, and also to carry their effects; they are made from string that is formed out of the inner bark of a tree. String is also made from the wool of the opossum and other animals; it is twisted up in a very ingenious manner, and the belt is always made of this, wound round and round the body, occupying an hour's work to take it off, which, however, they seldom do.

Wooden dishes are very common, made from the bend of a eucalyptus tree. By dint of patience and hard work they manage to press off the outer covering of the wood (taking off the bark first), and by scraping and burning make a first-rate dish.

It is very astonishing how they carve and decorate their weapons, only having sharp pieces of stone to do it with. They soon learn the use of the axe, chisel, and knife, and are not long in getting possession of them.

I have written this short account very hurriedly, and I fear it is not very well arranged. I have attempted to give a short description of what I have seen myself, and trust it will not be altogether without interest. It is a subject on which volumes might be written. The native races of Australia are fast dying out; wherever civilisation goes they disappear, so much so, that in South Australia and Victoria there are very few left, and it is quite rare you see one. Although very low specimens of humanity in many ways, still when civilised they are a very intelligent and good-natured people, and I have received many kindnesses from them.

Mr. SAUNDERS, Dr. SIMMS, Mr. CHARLESWORTH, and the PRESIDENT having offered some remarks, the author briefly replied.

Mr. Rudler read a paper on "The Papuans of New Guinea," by Captain Lawson—for the author.

The meeting then adjourned till November.

NOVEMBER 9TH, 1875.

Colonel A. LANE FOX, *President, in the Chair.*

The minutes of the last ordinary meeting were read and confirmed.

Major T. F. WISDEN, of Broadwater, Worthing, was elected a member.

The following list of presents was announced, and the thanks of the meeting were voted to the respective donors thereof:

FOR THE LIBRARY.

- From the INSTITUTION.—Journal of the Royal United Service Institution. Vol. XIX. Nos. 80—82.
- From the SOCIETY.—Transactions of the Royal Society of Literature. Vol. XI. Part 1.
- From the EDITOR.—Revue Scientifique. Nos. 52 and 1—19, 1875.
- From the BOARD.—Report of the Board of Public Charities, Pennsylvania. 1874.
- From Prof. F. V. HAYDEN.—Birds of the North-West. U.S. Geological Survey, 1874; by Elliott Cones. Bulletin of the U.S. Geological Survey; Nos. 2 and 3. Report of the U.S. Geological Survey of the Territories; by Prof. Hayden. Six Maps (Geological, &c.) of Colorado, &c.; by Prof. F. V. Hayden.
- From the SOCIETY.—Bulletin de la Société Impériale des Naturalistes de Moscou. No. 4, 1874; No. 1, 1875.
- From the SOCIETY.—Transactions of the Royal Society of Victoria. Vol. XI.
- From the SOCIETY.—Proceedings of the Royal Geographical Society; Vol. XIX. No. 81. President's Annual Address, 1875.
- From the ACADEMY.—Bulletin de l'Académie Impériale des Sciences de St. Petersbourg. Vol. XIX. Nos. 4 and 5; Vol. XX. Nos. 1 and 2.

- From the ASSOCIATION.—Report of the British Association for the Advancement of Science. 1874.
- From the SOCIETY.—Proceedings of the Royal Society. Vol. XXIII. Nos. 162 and 163.
- From the REGISTRAR-GENERAL OF NEW ZEALAND.—Result of a Census of the Colony of New Zealand. March, 1874.
- From the SOCIETY.—Journal of the Asiatic Society of Bengal; Part 1, No. 1; Part 2, Nos. 1—4. Proceedings of ditto; Nos. 2, 3, 4, 5, and 6, 1875.
- From the ASSOCIATION.—Journal of the East India Association. Vol. IX. Nos. 1 and 2.
- From the EDITOR.—Matériaux pour l'Histoire primitive et naturelle de l'Homme. Vol. VI. Nos. 7, 8, and 9; Supplement to Vol. VI.
- From the SOCIETY.—Transactions of the Watford Natural History Society. Vol. I. Parts 1 and 2.
- From the SOCIETY.—Memoirs of the Boston Society of Natural History; Vol. II. Part 3, Nos. 3, 4, and 5; Part 4, No. 1. Proceedings of ditto; Vol. XVI. Nos. 3 and 4; Vol. XVII. Nos. 1 and 2. Jeffries Wyman: Memorial Meeting, October, 1874.
- From JAMES BURNS, Esq.—Human Nature for July, August, September, and October.
- From the AUTHOR.—Gout at the Heart. By Dr. Eldridge Spratt.
- From the SOCIETY.—Jahrbuch der K. K. Geologischen Reichsanstalt; Vol. XXVI. No. 2. Verhandlungen, ditto, Nos. 6—10.
- From the SOCIETY.—Mittheilungen der Anthropologischen Gesellschaft in Wien. Vol. V. Nos. 4—9.
- From Messrs. LONGMANS AND CO.—Native Races of the Pacific States of North America. Vols. III. and IV. By H. H. Bancroft.
- From the EDITOR.—Archiv für Anthropologie, Band viii. No. 5.
- From the ASSOCIATION.—Proceedings of the Geologists' Association. Vol. IV. No. 3.
- From the SOCIETY.—Proceedings of the Philosophical Society of Glasgow. Vol. IX. No. 2.
- From the SOCIETY.—Transactions of the Society of Biblical Archaeology. Vol. VI. Part 1.
- From the AUTHOR.—Logic and Metaphysics. By T. S. Barrett.
- From the SOCIETY.—Proceedings of the Society of Antiquaries of London. Vol. VI. No. 4.
- From the SOCIETY.—Journal of the Asiatic Society of Great Britain and Ireland. Vol. VII. Part 2.
- From the INSTITUTION.—Journal of the Royal Institution of Cornwall. No. 17, 1875.
- From the INSTITUTE.—Proceedings of the Royal Colonial Institute from 1869 to 1875.
- From the SOCIETY.—Bulletin de la Société d'Anthropologie de Paris. Vol. IX. No. 4; Vol. X. Nos. 2 and 3.

- From the SOCIETY.—Transactions of the American Philosophical Society; Vol. XV. Part 2. Proceedings of ditto; Vol. XIV. No. 94.
- From the INSTITUTE.—The Canadian Journal. Vol. XIV. No. 5.
- From the ASSOCIATION.—Transactions of the Devonshire Association. Vol. VII.
- From the EXECUTORS of the late HENRY CHRISTY, Esq.—Reliquiæ Aquitanicæ. Part XVII. November, 1875.
- From the ASSOCIATION.—Journal of the Royal Historical and Archaeological Association of Ireland. Vol. III. No. 21.
- From M. VALDEMAR DE MAINOFF.—Ethnographic Map of the Russian Empire; Mongolia and Tangut. By N. Przhevalskago.
- From the AUTHOR.—Address, Department of Anthropology, British Association, Bristol, August 25th, 1875. By Prof. George Rolleston, F.R.S.
- From the EDITOR.—Nature (to date).
- From the SOCIETY.—Proceedings of the Society of Antiquaries of Scotland. Vol. IX. Part 2; Vol. X. Part 1.
- From the AUTHOR.—Naturalist's Rambles in the China Seas. By Dr. C. Collingwood.
- From the INSTITUTE.—The Smithsonian Report. 1875.

The Director read the following Resolution, which had been passed by the Council on that day:—

- "Proposed by the President, seconded by Mr. Francis Galton, F.R.S., and
 "unanimously resolved—
 "That this Council desire to place on record their esteem for the character,
 "and regret at the untimely death, of Commodore Goodenough, whose
 "life was sacrificed in the service of his country, and in the promotion
 "of anthropological science. They ask leave to offer their sincere and
 "respectful condolence to Mrs. Goodenough; and are the more moved
 "to do this by the recollection of the services rendered to science by
 "her lamented father, Mr. Hamilton."

The following papers were read by the author:

Short Notes on HEREDITY, &c., in TWINS. By FRANCIS GALTON, F.R.S. [With Woodcut.]

SOME subsidiary results that I obtained in an inquiry into the resemblances between twins, are perhaps worth recording as a separate memoir. My primary results were published in *Fraser's Magazine*, November, 1875, and are reprinted, with revision, among the miscellanies in this volume.

What I am now going to give, concerns the hereditary tendency towards twin-bearing, the largeness of the families in which twins are born, the degree in which they themselves contribute to the population, and the conditions of their sex.

First, in respect to heredity. It was impracticable to judge of this from my returns by any direct method. Twins do not marry so frequently as other people, and I think they are less fertile; hence the parents of twins, who are themselves one of a pair of twins, are relatively few, and the numerical ratio between such parents and the parents of twins generally, would be a fallacious test. Neither could I institute a direct comparison between two groups of children, one of whom were the offspring of fathers or mothers who themselves were of twin birth, and the other were not, because my material was insufficient. I therefore have confined myself to data derived from uncles and aunts.

I find with regard to 94 cases of twins, of whom I have sufficiently full returns, that they had a total of 1,065 uncles and aunts, and that among these there were 27 sets of twins.* In other words, there were twice 27, or 54 persons, who were severally one of a pair of twins among the 1,065 uncles and aunts—say 1 in every 20.

In the population generally the proportion is not nearly so great, but it varies largely under different conditions; and I therefore prefer to compare my returns with those derived from parallel returns supplied by precisely the same classes, which have been drawn up by Mr. C. Ansell, junr., in his most valuable "*Statistics of Families of the Upper and Professional Classes of England.*" It was compiled at the cost and under the direction of the National Life Assurance Society, and leaves nothing to be desired in its completeness, terseness, and adequacy. From these we learn that there is 1 twin birth to about every 100 ordinary births; in other words, there are 2 persons, each severally a twin, among every 101 persons—say 1 in every 50.

Hence the chance of an uncle or aunt of a twin being himself or herself a twin, is as 50 to 20, or $2\frac{1}{2}$ times as great as that of people generally. It may perhaps be thought simpler to state the result in this form:—Among the uncles and aunts of twins, there is an excess per cent. of three individuals of twin birth, due to hereditary causes. The average influence of heredity in fathers and in sons may be taken as fully five times as great as that in uncles and aunts; we should therefore expect, on general grounds, that the former would yield an excess of at least 15 per cent., or an absolute number of $15 \div 2 = 7\frac{1}{2}$ per cent. of individuals who were twins; but this, I feel sure, is in excess of the truth. (I have discussed these hereditary ratios, so far as ability was concerned, in my "*Hereditary Genius*," p. 321.)

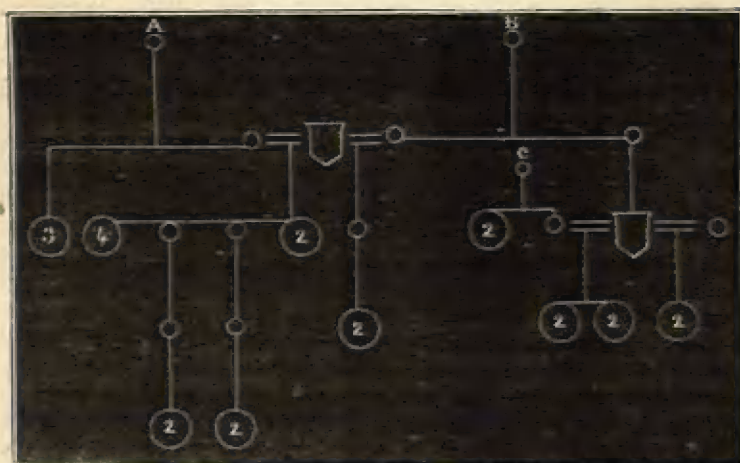
* To save complexity, I include among these, three cases in which the parent was one of the twins.

Next, as regards the relative power of the male and female in transmitting an hereditary tendency to bear twins. I find that the 94 sets of twins above mentioned had—

| | |
|------------------------------|-----------------------|
| On the father's side | 538 uncles and aunts, |
| Among whom were . . . | 14 sets of twins. |
| On the mother's side | 527 uncles and aunts, |
| Among whom were . . . | 13 sets of twins. |

These numbers may be considered identical, in a statistical sense; hence the hereditary tendency is the same in the male and female lines.

The largeness of the families in which twins are born is sufficiently manifest from these returns, which happen to be the only ones I possess that can be adduced in proof of it. We see that 94 sets of twins had, on the father's side, a total of 538 uncles and aunts, which, added to the 94 fathers, makes



632 individuals in 94 families; this is at the rate of $6\frac{2}{3}$ in each of the families of which the father of a twin was a member. Almost the same occurs (the precise figure is $6\frac{1}{3}$) in each family of which the mother of a twin was a member.

I annex a curious instance of the intermarriage of three twin-bearing families, A, B, and C. They all consist of many individuals; but my information is a little imperfect, and even if it were not, it would hardly be necessary to give more details than the number of multiple births and the connecting links between them. I may add that the three families are well known socially, and have each of them distinguished members. The circles in the diagram indicate the cases of

multiple births, and the figures inside the circles show the number of children born on each of these occasions. It will be observed that in three generations there were produced one quadruplet, one triplet, and eight pairs of twins.

A very instructive fact has been related to me concerning a family remarkable for its twins; in which it appears, according to the mother's account, that whenever single children were born to her, they always had six fingers and six toes, but the sets of twins never had. This shows a strong constitutional tendency to multiple propagation.

The vigour of body and mind of those twins who survive infancy, who strongly resemble one another, and who have sent me returns, is certainly not below the average. On the contrary, I find, from the returns that I have received, that nearly one-half of them are decidedly above par; and thence I infer that more than one-half are somewhat above par. It is easy to adduce instances of vigorous twins. One of my own correspondents, a twin, was a senior wrangler; Lords Eldon and Stowell had each a twin sister; and among others who have successfully fought the battles of life may be mentioned Bendigo, the ex-champion pugilist, who was one of a triplet birth.

Notwithstanding Sir J. Simpson's statistical results,* I still think the popular belief to be a true one, that twins contribute less to the population than other people. My returns were not framed to afford a direct answer to the question of their fertility; but I can incidentally gather enough from them to be sure of the fact; also that there is not so strong a tendency among twins to marry, as among other people (however this may be accounted for); and lastly, that the popular belief that both twins, whether of the same or opposite sexes, *never* have children, is erroneous, for I have many instances to the contrary.

There is nothing known in the human race, except as a great rarity, corresponding to the "free-martin" † in cattle; and where known, it has never yet been found, so far as I am aware, in connection with twin births. Neither is this peculiarity of neutral sex found in such domestic animals as dogs or cats, except in the rarest instances; but in the horse, ass, and sheep, and especially in cattle, it is comparatively common.

John Hunter's "Memoir on the Free-Martin" (vol. iv. p. 34,

* Obstetrical Memories, i. p. 327.

† Marten seems originally to have meant an animal intended to be killed at Martinmas, which was the period in former years, before the introduction of root-crops, when cattle were slaughtered and salted down for the winter's food of the population. As barren cows were slaughtered preferably to others, the name of marten became especially applied to them. Why the animals about which I have been speaking were called free-martens, it is not altogether clear. Free might mean "naturally admitted to the privilege" of being slaughtered at Martinmas.

edition of 1837) is extremely curious. It appears that when a cow (he says he can only speak of black cattle, but I understand it is a more general fact) brings forth two calves, one of which is a bull calf and the other, to external appearance, a cow calf, the former grows up into a proper bull, but the latter does not commonly grow into a proper cow. The animal is unfit for propagation, and is kept for labour and fattening, like an ox; and it is as well known as a specific form of cattle as is the bull or cow, and is called a "free-martin" by farmers. Close examination and dissection show that the animal is neither a complete female nor male, but combines the anatomical characteristics of both in a very undeveloped and imperfect manner; and those of the male rather predominate over those of the female. This, at least, is the modern view. Hunter's three dissections of free-martins still exist in the Museum of the Royal College of Surgeons, in the teratological division. (See the catalogue of it, pp. 97—101.) Sir J. Simpson subsequently investigated the subject. His principal memoir, alluded to above, is most interesting; and there are several other allusions to free-martins, and to writers upon them, to be found elsewhere in the two volumes of his memoirs.

There is a peculiarity in the sexes of twins; they tend to accord. The word "twin" covers different classes of events—those in which each twin is derived from a separate ovum, and those in which they come from two germinal spots in the same ovum. In the former case they are enveloped, previously to their birth, in separate membranes; and in the latter in the same membrane. Now it appears that twins enveloped in the same membrane are invariably of the same sex, and these, according to the cases of Späeth, who has evidently taken great pains to secure reliable data,* are 24 per cent. of the whole number. (This is, however, greatly in excess of other estimates, which usually give about 6 per cent.) In the remainder they have either one placenta between them, and two membranes, or else they are quite independent, and have separate placentas and membranes. The statistics as to members and sexes under these conditions, vary so astonishingly that I can conclude nothing concerning them. The general upshot is, that about twice as many twins are born of the same sex as of opposite sexes; whereas if there were no influences to produce accord, and on the supposition of an equality of male and female births generally, the numbers ought to be equal.†

* "Studien über Zwilligen." Zeitschrift der Wiener Gesellschaft der Aerzte, 1860. Nos. 15 and 16.

† This is clear, as was pointed out by Mr. C. Ansell, from the following considerations. Supposing absolute independence of sex, the births may be: (1) boy

I have explained in my memoir above alluded to (reprinted in the miscellanies of this volume from *Fraser's Magazine*), that it is only among twins of the same sex, and therefore presumably only among twins derived from the same ovum, that we find an extremely close likeness, or else an extremely marked dissimilarity. On the other hand, in twins of the opposite sex, we find only an ordinary family likeness or dissimilarity. To this I shall recur in my Memoir on the Theory of Heredity that is about to be read, and I will now conclude the present one.

A THEORY of HEREDITY. By FRANCIS GALTON, F.R.S.*

MR. DARWIN stated, in the year 1868, in the preface to his theory of Pangenesis,† that "every one appears to admit that the body consists of a multitude of 'organic units,' each of which possesses its own proper attributes, and is to a certain extent independent of all others;" and it may be safely asserted that the general expression of biological opinion since that date has been emphatically the same. We may therefore rest assured that the hypothesis of organic units, and all that such an hypothesis implies, must lie at the foundation of the science of heredity. It remains to determine further particulars; we have to examine how far the details of such theories as are based upon the hypothesis of organic units are correct, and to consider how their deficiencies may be supplied.

The facts for which a complete theory of heredity must account may conveniently be divided into two groups; the one refers to those inborn or congenital peculiarities that were also congenital in one or more ancestors, the other to those that were not congenital in the ancestors, but were acquired for the first time by one or more of them during their lifetime, owing to some change in the conditions of their life.

The first of these two groups is of predominant importance, in respect to the number of well-ascertained facts that it contains, many of which it is possible to explain, in a broad and general way, by more than one theory based on the hypothesis of organic units. The second group includes much of which the evidence is questionable or difficult of verification, and

and boy; (2) boy and girl; (3) girl and boy; (4) girl and girl. All these events would in the supposition be equally likely, and they give two cases of the same, and two of opposite sexes.

* This memoir was in type for publication in the December number of the *Contemporary Review*, at the time when it was read before the Anthropological Institute. I have taken the opportunity afforded by a reprint, to revise it considerably, and to amend it in many particulars.—F. G.

† Darwin: "Variation of Plants and Animals under Domestication," ii. 370.

which, as I shall endeavour to show, does not, for the most part, justify the conclusion commonly derived from it. In this memoir I divide the general theory of heredity into two parts, corresponding respectively to these two groups. The first stands by itself, the second is supplementary and subordinate to it.

No theory of heredity has been enunciated with more clearness and fulness than that of Mr. Darwin's *Pangenesis*, and the preparatory statement to that theory contains the most elaborate epitome that exists, of the many varieties of facts for which a complete theory of heredity must account. What I have now to say, is largely based on the arguments and considerations brought forward by Mr. Darwin in support of *Pangenesis*; nevertheless the conclusions in this paper will be seen to differ essentially from his own. *Pangenesis* appears more especially framed to account for the cases which fall in the second of the above-mentioned groups, which are of a less striking and assured character than those in the first group, and it will be seen that I accept the theory of *Pangenesis* with considerable modification, as a supplementary and subordinate part of a complete theory of heredity, but by no means for the primary and more important part.

Before proceeding, I beg permission to use, in a special sense, the short word "*stirp*," derived from the Latin *stirpes*, a root, to express the sum-total of the germs, gemmules, or whatever they may be called, which are to be found, according to every theory of organic units, in the newly fertilised ovum—that is, in the earliest pre-embryonic stage—from which time it receives nothing further from its parents, not even from its mother, than mere nutriment. (It is hardly necessary to remind the reader that not a drop of blood from the mother penetrates into the vessels of the embryo, but that the two circulations are wholly distinct; the placenta to which the embryo is attached, and with which it is in vascular connection, being itself nourished from the mother by mere imbibition.) This word "*stirp*," which I shall venture to use, is equally applicable to the contents of buds, and will, I think, be found very convenient, and cannot apparently lead to misapprehension.

The whole of the "*stirp*," together with much of mere nutriment, is packed into a space not exceeding the size of the head of a pin, for that is about the size of the newly fertilised ovum, which, curiously enough, is the same in all mammalia. It is evident that direct observation can tell us nothing concerning the form and behaviour of such minute objects as the germs of which the *stirp* is composed; they would be far beyond the ken of the microscopist, even if their separate

actions upon light were different. But even this is not the case, for the fertilised ovum is almost homogeneous in colour. Ova and their contents are, to biologists looking at them through microscopes, much what mail-bags and the heaps of letters poured out of them are to those who gaze through the glass windows of a post office. Such persons may draw various valuable conclusions as to the postal communications generally, but they cannot read a single word of what the letters contain. All that we may learn concerning the constituents of the stirp must be through inference, and not by direct observation; we are therefore forced to theorise.

We will begin with a statement of the four postulates that seem to be almost necessarily implied by any hypothesis of organic units, and which are included in that of Pangenesis. The first is, that each of the enormous number of quasi-independent units of which the body consists, has a separate origin, or germ. The second is, that the stirp contains a host of germs, much greater in number and variety than the organic units of the bodily structure that is about to be derived from them; so that comparatively few individuals out of the host of germs, achieve development. Thirdly, that the undeveloped germs retain their vitality: that they propagate themselves while still in a latent state, and contribute to form the stirps of the offspring. Fourthly, that organisation wholly depends on the mutual affinities and repulsions of the separate germs; first in their earliest stirpal stage, and subsequently during all the processes of their development.

Proofs of the reasonableness of these postulates are especially to be found in the arguments of Mr. Darwin: that there is at least a fair ground to believe in their reasonableness, may be shown in a cursory manner. Thus, the independent origin of the several parts of the body may be argued from the separate inheritance of their peculiarities. If a child has its father's eyes and its mother's mouth, these two features must have had a separate origin. Now, it is observed that peculiarities, even of a microscopic kind, are transmissible by inheritance, and therefore it may be concluded that the minutest parts of the body have separate origins. That the stirp contains a much greater variety of germs than achieve development is proved by the fact that a person is capable of transmitting a variety of ancestral peculiarities to his children, that he did not himself possess. But since everything that reached him from his ancestors must have been packed in his own stirp, it follows that his stirp contained in addition to such peculiarities as were developed in his own bodily structure, those numerous other ancestral pecu-

liarities of which he was personally destitute, but which he bequeathed to one or more of his descendants. Therefore every stirp must be held to contain a great variety of germs in addition to those that may achieve development in the person who grows out of that stirp. It further follows, that these residual germs retain their vitality, and contribute to form the stirp of the descendants, as will be explained more fully further on. The fourth and last postulate, that organisation wholly depends on the mutual affinities of the separate organic units, commends itself to acceptance by the simplicity and sufficiency of what is asked; much of what I have to say in this paper, will testify to this. We must also bear in mind, that the alternative hypothesis of a general plastic force resembles that of other mystic conceptions current in the early stages of many branches of physical science, all of which yielded to molecular views, as knowledge increased. The science of heredity is still in an early stage, and analogy disposes us to expect that its course will be similar to that of its predecessors. The possibility of such minute objects as the germs possessing sufficient delicacy of perception to ensure that each of so enormous a variety of them should find its place, was illustrated by Mr. Darwin through the delicate perception of the pollen grains of the different species of plants. He says: * "About 10,000 composite exist, and there can be no doubt that if the pollen of all the species could be simultaneously or successively placed on the stigma of any one species, this one would elect, with unerring certainty, its own pollen." The partial failures in the action of these affinities are most instructive, as where a mark of any kind on the skin is transmitted by inheritance in an altered situation, to a neighbouring or to an homologous part. Having stated thus much by way of preface, we may now proceed freely.

Much wonder is expressed by physiologists at the apparent fact that none, at least of the higher races, admits of being long maintained through any system of unisexual parentage; but that a deterioration, which we may reasonably ascribe to a deficiency of some of the structural elements, is always observed to set in and gradually to increase, the race ultimately perishing from that cause. A system of double parentage is therefore a very important requirement, some think an essential one, to secure the indefinite maintenance of any race whose organisation is complex. What is the explanation of this? In the first place, double parentage should be looked upon as the primary requirement, and sex as the consequence, not the cause of that requirement. There are not of a necessity two sexes,

* "Variation of Plants and Animals under Domestication," ii. 380.

because swarms of creatures of the simplest organisations mainly multiply by some process of self-division. On the other hand, as I shall endeavour to show, there is a theoretical advantage in a system of double parentage, which grows to be of paramount importance, as organisations increase in complexity. But it is through the evolution of sex, that a system of double parentage is secured, and, therefore, I would submit, it is to the need of the latter that we must ascribe the existence of the former. The opposite view is certainly erroneous, namely, that sex is an inherent necessity, and that double parentage is the simple consequence of it. Such a sequence, which, perhaps, represents the common and unreasoned theory, is, to use a common phrase, "putting the cart before the horse." As has been just remarked, in many of the lowest forms of organised life, double parentage exists, but sex apparently does not, because any two cells seem able to conjugate and to combine their contents within a single cell; these forms are also capable of easy unisexual multiplication by self-division or by budding. Proceeding higher in the scale of life, the sexual differentiation becomes increasingly marked, and unisexual propagation is of rarer occurrence. At length we reach a stage where the differentiation of sex is complete, and the power of unisexual propagation is wholly lost. Now the necessity of a system of double parentage in complex organisations, is the immediate consequence of a theory of organic units and germs, as we shall see if we fix our attention upon any one definite series of unisexual descents, and follow out its history. Suppose we select, cut off, and plant the second bud, then after it has grown to maturity we similarly take the second of *its* buds, and so on consecutively. At each successive stage there is always a chance of some one or more of the various species of germs in the stirp dying out, or being omitted; and of course when they are gone they are lost for ever, and are irreplaceable by others. From time to time this chance must fall unfavourably, and will cause a deficiency in some of the structural elements, and a consequent deterioration of the race. If the loss be vital, this particular line of descent will of course be extinguished at once; but on the more favourable supposition, the race will linger on, submitting to successive decrements in its constituent elements, until the accumulation of small losses becomes fatal. What is true for the series of second buds in our example, is of course equally true for any system we please to specify, and therefore it would be generally true in the experience of gardeners and others.*

* It might be worth the while of the mathematical reader to refer to a paper on an analogous subject, "The Extinction of Surnames," by the Rev. H. W. Watson, in the *Journal of the Anthropological Institute*, 1874, p. 138, to which there is a page of preface by myself.

But in a free state of nature, where the weakly plants are supplanted by those that remain sound, a new consideration is introduced. Here we have to consider, on the one hand, the growing chance against the deterioration of each single line of descent, and on the other, the growing number of all possible lines of descent. They both proceed in a geometrical ratio; and if the ratio of the latter exceeded that of the former, extinction need not take place. But, again, this excess would become an impossibility after a certain degree of complexity had been reached, because with growing complexity, the chance of deterioration must increase, while the fecundity (see H. Spencer's 'Biology,' vol. i. "Multiplication") necessarily diminishes. On the other hand, when there are two parents, and therefore a double supply of material, the chance deficiency in the contribution from either of them, of any particular species of germ, tends to be supplied by the other. No doubt, cases must still occur, though much more rarely than before, in which the same species of germ is absent from the contribution of both, and a very small proportion of the families will thereby perish. But what if they do become extinct? The remaining families are perfectly sound, or tend to become so in each succeeding generation, and they fill up, only too easily, the gap. Thus we see that in any specified course of unisexual generation, every line of descent is doomed to extinction, sooner or later; but that in bisexual, only a very small proportion of families become extinct, or even temporarily suffer, from the cause we are considering, while the great majority do not suffer a whit, and those few who do, tend to become rehabilitated. There is yet another advantage in double parentage, namely, that as the stirp whence the child sprang, can be only half the size of the combined stirps of his two parents, it follows that one half of his possible heritage must have been suppressed. This implies a sharp struggle for place among the competing germs, and the success, as we may infer, of the fitter half of their numerous varieties.

The limitation of space in the stirp must compel a limitation not only to the number of varieties of each species of germ, but also to the number of individuals in each variety. The knowledge of such a fact is helpful, and appears to be needed, in accounting for the not very large number of subdivisions in which peculiarities are transmitted. I am not now considering cases of the slow loss of some characteristic of a race, which proceeds by minute gradations, and which may be ascribed, at least in part, to a change in the quality of the germs, nor am I now speaking of cases where it is clear that one of two alternative qualities has overpowered the other, but of instances where they are

equipotent and in no way antipathetic. Thus, in the gradual breeding-out of negro blood, we may find the colour of a mulatto to be the half, and that of a quadroon to be the quarter of that of his black ancestors; but as we proceed further, the subdivision becomes very irregular; it does not continue indefinitely in the geometrical series of one-eighth, one-sixteenth, and so on, but it is usually present very obviously, or not at all, until it entirely disappears. There are many more gradations in compound results, as in an expression of the face, because any one of its elementary causes may be present or absent; and as the number of possible combinations or alternatives, among even a few elements, is very great, there must be room for a large number of grades between the complete inheritance of the expression and its total extinction.

It is certain, from the rapidity of the visible changes in the substance of the newly fertilised ovum, that the germs in the stirp are in eager and restless pursuit of new positions of organic equilibrium, due, as we may suppose, to the unequal rates of development of some of the better nourished germs. We see that segregations occur as much as aggregations, and it is reasonable to suppose that repulsions concur with affinities in producing them. We know nothing as yet of the nature of these repulsions and affinities, but it seems hardly possible to account for the whole state of affairs on the hypothesis of a purely step-by-step development like that proposed in Pangenesis, where B follows A, and C follows B, and so on. It is difficult to suppose the directions of the mutual influences of the germs to be limited to lines, like those that cause the blood-corpuscles to become attached face to face, in long rouleaux, when coagulation begins; neither can we suppose them limited to planes, like those that govern the harmonious groupings of the flora and fauna on the face of a land left in a state of nature; but we ought rather to expect them to act on many sides, in a space of three dimensions, just as the personal likings and dislikings of an individual in a flying swarm may be supposed to determine the position that he occupies in it. Each germ has many neighbours: a sphere surrounded by other spheres of equal sizes, like a cannon ball in the middle of a heap of them, when they are piled in the most compact form, is in immediate contact with no less than twelve others. We may therefore feel assured, that the germs must be affected by numerous forces on all sides, varying with their change of place, and that they must fall into many positions of temporary and transient equilibrium, and undergo a long period of restless unsettlement, before they severally attain the positions for which they are finally best suited. However ignorant we may be

at present of the character of these affinities and repulsions, or of what Mr Herbert Spencer calls their polarities, in his instructive chapters in the first volume of his "Principles of Biology," a conviction of their existence is sufficient to afford general notions of what must be their mode of action, and enables us to illustrate its necessary consequences by many familiar experiences. Chief among these are the events of political life, such as those connected with the struggle for place and power, with election, and with representation. We know that the primary cells divide and subdivide, and we may justly compare each successive segmentation to the division of a political assemblage into parties, having, thenceforward, different attributes. We may compare the stirp to a nation and those among its germs that achieve development, to the foremost men of that nation who succeed in becoming its representatives; lastly, we may compare the characteristics of the person whose bodily structure consists of the developed germs, to those of the house of representatives of the nation. These are not idle metaphors, but strict analogies; they will be found to bear consideration, and to be worthy of being pursued, as they give a much-needed clearness to views on heredity.

The great dissimilarity frequently observed between brothers or sisters is to be accounted for and easily illustrated by a political metaphor. We have to recognise, on the one hand, that the stirps of the brothers and sisters must have been nearly alike, because the germs are simple organisms, and all such organisms breed true to their kind, and on the other hand, that very different structures have been developed out of those stirps. A strict analogy and explanation of all this is afforded by the well-known conditions and uncertainties of political elections. We have abundant experience that when a constituency is very varied, trifling circumstances are sufficient to change the balance of parties, and therefore, although there may be little real variation in the electoral body, the change in the character of its political choice at successive elections may be abrupt. A uniform constituency will always elect representatives of a uniform type; and this result precisely corresponds to what is found to occur in animals of pure breed, whose stirp contains only one or a very few varieties of each species of germ, and whose offspring always resemble their parents and one another. The more mongrel the breed, the greater is the variety of the offspring.

In twins of the same sex a dissimilarity is not unfrequently found of a more marked description than that between ordinary brothers and sisters, notwithstanding that the embryonic conditions of the twins must have been closely similar. This is a very

curious subject, and requires the following explanation. I had occasion to make many inquiries into the resemblances of twins, whence it appeared that among well-formed "true" twins,* so to speak, namely, those who, up to the time of their birth, were enclosed in the same membrane, and had therefore been developed out of two germinal spots in the same ovum, there exist two groups of cases that contrast strangely with one another, while there are, comparatively speaking, only a few intermediate cases. In the larger of the two groups, the twins are exceedingly alike in body and mind; also in their growth, illnesses, and decay, and their resemblance is not unfrequently such as to justify the somewhat startling incidents referring to twins, that are to be found in many works of fiction. In the smaller group, which contains perhaps one-fourth as many cases as the larger, the twins are absolutely unlike; so much so, that they have occasionally been described as "complementary" the one to the other—the one having what the other lacked. What can be the reason that, out of identically the same primary stirp, either two absolutely dissimilar persons can be developed, or else two closely similar ones; while the intermediate cases are comparatively rare, so that they may be considered due to quite another and more common contingency—namely, that in which the twins are not produced out of the same ovum, but from separate ova? The answer I suggest is as follows:—As regards the similarity of true twins, there can be little difficulty; we should expect, on statistical grounds, that the two halves of any assemblage of germs would be much alike. The secondary stirps of the twins being alike, and the circumstances under which the bodily structure is developed out of them being almost identical, the results must be closely similar. On the other hand, as regards the dissimilarity, we might expect that if there had happened to be a sufficient delay before the division of the primary stirp, to allow its germs to arrange themselves somewhat according to their affinities, the twin halves of the primary stirp would be strongly contrasted. Political analogies may again be appealed to with advantage. In the case of an ordinary single birth, each germ that achieves development may be compared to the sole representative of a body of electors,

* For some general results of these inquiries, see the paper printed in the miscellanies of this volume. I had twenty cases of strong dissimilarity in twins, and in all the cases the twins were of the same sex. Now it appears to be a rule without exception that what I have above termed "true" twins are of the same sex. Such twins are by no means uncommon; Späeth's estimate of their frequency, as compared to that of twin births generally, is as high as 25 per cent., and I understand that his observations rank among the very best; however, the estimates of other observers are much lower. Hence there is much probability that my cases of strong dissimilarity were usually, if not invariably, cases of true twins. But I have no direct evidence one way or the other.

each of whom has a single vote; then, in the case of twins, two representatives have to be elected, each elector still having only a single vote. If one of the political parties slightly predominates, and if the electoral body be divided by an accidental line, the same party would predominate in each division; consequently if the election happened to be so conducted, both representatives would be men of the same predominant party, and of identical politics. But if the electoral body acted as a whole, the predominating party would be unable to return more than a single candidate; consequently the two representatives would be men of opposite politics.

Individual variation depends upon two factors; the one, is the variability of the germ and of its progeny; the other, is that of all kinds of external circumstances, in determining which out of many competing germs, of nearly equal suitability, shall be the one that becomes developed. The variability of germs under changed conditions, and that of their progeny, may be small, but it is indubitable; absolute uniformity being scarcely conceivable in the condition and growth, and, therefore, in the reproduction of any organism. The law of heredity goes no further than to say, that like *tends* to produce like; the tendency may be very strong, but it cannot be absolute. The effect of the second of the factors mentioned above, is that a very slight variation in the germs may have a momentous effect in the personal structure that is developed out of a comparatively small number of them. There are numerous competing germs in the place of each unit of structure, and only one of the competitors can succeed in each case. When the competition is close, a very slight difference, either in the intrinsic quality of the germ, or in its temporary position at some critical time, or in any other variable circumstance, may determine its success. It may well happen, that some species of germs may have failed in achieving development during very many generations, by the end of which time they may have become considerably modified, and at length, partly owing to their intrinsic improvement, and partly to the accident of favourable circumstances, that species may suddenly vanquish its competitors and achieve development, and be the cause of a marked individual variation. The chain of sequences would have been perfectly continuous, though its manifestation in the form of personal structure would appear strangely capricious. Precisely similar catastrophes are of notoriously frequent occurrence in political and social life.

Those germs which have become developed into cells, have been supposed (I believe universally) to be the important, if not the chief agents in maintaining the progeny of germs; in other

words, of influencing heredity. This is certainly an essential condition in the theory of Pangenesis, as the name of that theory testifies; there, each separate cell in its nascent state is supposed to throw off germs that circulate freely in the body along with the others that had been hereditarily transmitted. It is from among the general mass of these, that certain groups are supposed to aggregate themselves, owing to their mutual affinities, and so to form the sexual elements. For my own part, while acknowledging that there is undeniable evidence of the existence of the power of cells to throw off germs, which will be discussed when we come to the second group of cases, I shall endeavour to show that its effects on inheritance generally, are minute and secondary. My argument is this: Of the two groups of germs, the one consisting of those that succeed in becoming developed, and in forming the bodily structure, and the other consisting of those that remain continually latent, the latter vastly preponderates in number. We should expect the latent germs to exercise a corresponding predominance in matters of heredity, unless it can be shown that, on the whole, the germ that is developed into a cell, becomes thereby more fertile than if it had remained latent. But the evidence points the other way. It appears both that the period of fertility is shorter, and the fecundity even during that period is less in the germ that becomes developed into a cell, than they are in the germ that remains latent. Much less then would the entire bodily structure, which consists of a relatively small number of these comparatively sterile units, successfully compete in matters of heredity with the total effect of the much more numerous and more prolific units which are in a latent form. The shortness of the period of fertility of the germ that becomes developed, is implicitly acknowledged even by the author of Pangenesis, who considers it to cease so soon as the cell is completely formed (*op. cit.* ii. 374), and the hypothesis that the developed germ is less fecund, even during its short period of fertility, than the germ that continues latent, agrees singularly well with many classes of fact. Thus it explains why, although hereditary resemblance is the general rule, the offspring is frequently deficient in the very peculiarity for which the parent was exceptionally remarkable. We can easily understand that the dominant characters in the stirp will, on the whole, be faithfully represented in the structure of the person who is developed out of it; but if the personal structure be a faithful representative of the dominant germs, it must be an over-favourable representative of the germs generally, and therefore, *a fortiori*, of the undeveloped residue; nay, in extreme cases, the personal elements may be absolutely misrepresentative of the residual

elements, the accidental richness of the sterile sample in some particular valuable variety of germ, having drained the fertile residue of every germ of that variety. The possibility of this occurrence is the more credible, since, as we have already seen, the number of germs of each variety cannot be very large. Experience testifies to the fact that children of men of extraordinary genius have not unfrequently been singularly deficient in ability, and this condition has been especially remarked in instances where the man of genius was himself the offspring of a mediocre ancestry; where, therefore, according to the above theory, the number of valuable germs were few, and all of them were used up and rendered comparatively sterile in the structure of his own person. The steady tendency to deterioration in exceptional peculiarities is likewise shown by the avowed difficulty, among breeders, of maintaining the high character of any valuable variety that has been produced by accident (that is, by some happy combination of a number of unknown variable causes). Another result of the best elements of the stirp being rendered sterile, is the strong tendency to deterioration in the transmission of every exceptionally gifted race. That this is a universal tendency among races in a state of nature, is proved by the fact that existing races are only kept at their present level by the severe action of selection. If they were left unpruned even for a single generation, the weaker members would survive, and the average quality of the race would necessarily diminish.

Again, the sterility of the developed elements of the stirp explains the fact of certain diseases skipping one or more generations, if the further very reasonable postulates are granted, that the germs of those diseases are both prolific and gregarious. Thus, nearly all the gout molecules in the stirp whence A sprang might, owing to their gregarious nature, become developed in the person of A, and so be rendered sterile; the small fertile residue in his stirp would be insufficient to supply that of his son B with enough gout germs to dominate and achieve development in the person of B, consequently they would be husbanded; then, owing to their prolific character, they would so multiply in a latent form in the structure of B, as to insure transmission in sufficient numbers to the stirp of C the son, or D the grandson, to enable them to achieve development in the person of C or D, just as they had done in that of A; and so the cycle would be repeated.

The conclusion from what has thus far been said is amply confirmed by observation; it is:—I. That the contents of the stirp must segregate themselves into divisions or septs, and that these septs must subdivide again and again, under the influence

of the mutual attractions and repulsions of their units, just as a large political party may repeatedly subdivide itself into different factions. (2.) That the dominant germs in each successive sept are those that achieve development. (3.) That it is the residual germs that are the parents of the sexual elements or buds.

No process of subdivision like that which has just been described could be expected to take place with perfect accuracy; no political party was ever split with such clean precision into two political septs, that none of the A party were included in the ranks of B, and *vice versa*. We must therefore feel assured that germs of many alien species would be included in each successive sept. Also, we may reasonably suppose that the structure formed out of those germs that have developed into cells, must afford many convenient places for the lodgment and sustenance of the alien germs; consequently, representatives of all parts of the residue of the stirp would be found dispersed all over the body. Lastly, we cannot but expect that these alien germs, when they thrive and multiply, would somewhat transgress the bounds of the cell or cell-interspace in which their progenitors had lodged, knowing that even so large an object as a blood-corpuscle will occasionally find its way through the unruptured wall of a capillary vessel. This is a very different supposition to that of the free circulation of gemmules in Pangenesis, yet it seems to have the merits of that theory (so far as the group of cases are concerned which we are now considering, namely, the inheritance of qualities that were congenital in the ancestry), and at the same time to be free from the many objections that are urged against the theory of Pangenesis. These are as follows:—On physical grounds, we cannot understand how colloid bodies, such as the Pangenetic gemmules must be, could pass freely through membranes. Moreover, if they did, the paternal gemmules in the body of the unborn child would diffuse themselves equally over the body of the child and that of its mother; consequently there would be very few remaining in the body of the child, while, on the other hand, there would be an invasion of maternal gemmules. The final result of this would be, that the individual would transmit his or her maternal peculiarities far more than his or her paternal ones; in other words, people would resemble their maternal grandmothers very much more than their other grandparents, which is not at all the case. That the gemmules are not contained, in any large number, in the blood-vessels, is proved by my own experiments, in which I largely transfused the blood of an alien species of rabbit into the blood-vessels of male and female silver-grey rabbits, from which I afterwards bred. I repeated this process

for three generations, and found not the slightest sign of any deterioration in the purity of the silver-grey breed.*

Again, a free circulation of the gemmules, such as Pangenesis supposes, would cause various events to be extremely common, whereas the supposition of their transgression through a small space beyond their original limits, shows them to be possible, though infrequent, just as they actually are. I mean such cases as the zebra-marks on the foal out of a thoroughbred mare by a thoroughbred horse, owing to the former having once borne a mule to a zebra; the action of pollen on the tissues adjacent to the fertilised pistil of a different variety of plant. The distribution of the germs, by the agency I supposed, all over the body, would account equally with Pangenesis for the replacement of a lost limb in the lower animals, and the reparation of simple tissues in the higher ones. It would much transcend my limits if I were to enter at length into these and kindred questions; but it is not necessary to do so, for it is sufficient to refer to Mr. Darwin's work, as already quoted, where they are most fully and carefully discussed, and to consider, while reading it, whether the theory I have proposed could, as I think it might, be substituted with advantage for that of Pangenesis. I must repeat, that I limit these remarks to the very large proportion of cases that fall into the first of the two groups, in which I am discussing the facts of heredity.

It will be convenient at this place to contrast the views that have been thus far set forth with those of Mr. Darwin in his theory of Pangenesis. That theory affirms as follows:—

(1.) There are cells, and there are a great number of gemmules.

(2.) The cells multiply by self-division, and during this process they throw off gemmules. [I look upon this process of throwing off gemmules to be of such minor importance as to have no effect whatever upon the cases we have thus far considered. Its existence is granted, but only as a subordinate process, to account for the exceptional cases to be hereafter considered, and not as the primary process in heredity.]

(3.) The gemmules multiply by self-division, and any gemmule admits, under favourable circumstances, of being developed into a cell. [I look upon this as the primary process in heredity.]

(4.) The personal structure is formed by a process analogous to the fertilisation of each gemmule that becomes developed

* The experiments on the first generation were published *Proc. Royal Society*, 1871, p. 393; but see Mr. Darwin's remarks in *Nature*, 1871, p. 502, as to my conclusions. I subsequently carried on the experiments with improved apparatus, and on an equally large scale, for two more generations.

into a cell, by means of the partially developed cell that has preceded it in the regular order of growth. [I look on it as due, first, to the successive segmentations of the host of gemmules that are contained in the newly fertilised ovum, owing to their mutual affinities and repulsions; and, secondly, to the development of the dominant or representative gemmules in each segmentation, the others remaining dormant, and are called, for convenience, in the next paragraph, the "residue."

(5.) The sexual elements are formed by aggregations out of the gemmules, all of which are supposed to travel freely throughout the body. [I look on the sexual elements as directly descended from the "residue," and do not suppose the gemmules to travel freely. I allow some very moderate transgression across the bounds of their domiciles, and something more than that, under the limitations that will be described in the latter part of this memoir.]

[I account for all varieties of the gemmules being found in all parts of the body, by the above-mentioned segmentations being never clean and precise. Hence it follows that each segmentation must contain stray and alien gemmules, and I suppose that many of these become entangled and find lodgment in the tissue developed out of each segmentation.]

We will next proceed to examine the cases that fall into the second group; they are those in which characters created artificially in the person of the parents, are transmitted by inheritance to their offspring. In considering what appear at first sight to be cases in evidence of this, we must be extremely careful not to confuse the effects of totally different processes.

We have thus far dealt with three agents—(1) the stirp, which is an organised aggregate of a host of germs; (2) the personal structure, developed out of a small portion of those germs; and (3) the sexual elements, generated by the residuum of the stirp. The cases before us are those which are supposed to prove that 2 reacts on 3—that is, the personal structure upon the sexual elements. The first and the largest class of these cases refer to adaptivity of race. It is said that the structure of an animal changes when he is placed under changed conditions; that his offspring inherit some of his change; and that they vary still further on their own account, in the same direction, and so on through successive generations, until a notable change in the congenital characteristics of the race has been effected. Hence, it is concluded that a change in the personal structure has reacted on the sexual elements. For my part, I object to so general a conclusion, for the following reasons. It is universally admitted that the primary agents in the processes of growth, nutrition, and reproduction are the same, and that a

true theory of heredity must so regard them. In other words, they are all due to the development of the same germinal matter, variously located. Consequently, when similar germinal matter is everywhere affected by the same conditions, we should expect that it would be everywhere affected in the same way. The particular kind of germ whence the hair sprang, that was induced to throw out a new variety in the cells nearest to the surface of the body under certain changed conditions of climate and food, might be expected to throw out a similar variety in the sexual elements at the same time. The changes in the germs would everywhere be collateral, although the moments when any of the changed germs happened to receive their development, might be different. So far from there being evidence that the changed structure of the hair causes the germs in the sexual organs to vary, it may often happen that the latter are the first to change. Thus the progeny of thick-fleeced sheep, newly imported into the tropics, may begin to lose wool earlier than their parents. There is not a shadow of proof that the adaptivity of a race to changed conditions, *affecting all parts of the body alike*, is due to the reaction of changed personal structure upon the sexual elements. Another instance of simultaneous action is to be found in the fact that a drunkard is often known to have imbecile children, although his offspring previous to his taking to drink were healthy. The alcohol pervades his tissues, and, of course, affects the germinal matter in the sexual elements as much as it does that in the cells which form the structure of his own nerves. Exactly the same result must occur in the case of many constitutional diseases that have been acquired by long-continued irregular habits. The case is different as regards those conditions that have a local influence; but races are very slow in adapting themselves to these.

Another class of evidence brought forward in proof of the inheritance of non-congenital peculiarities concerns mutilations. No doubt the industry of M. Prosper Lucas, and of many others, has brought together several curious cases; but the negative evidence, that is to say, the certainty of the non-inheritance of mutilations in a vast number of cases (see Darwin: "Variation of Plants and Animals under Domestication," ii. 23), is so overpowering, that it may still be reasonable to look upon the former as no more than a collection of coincidences. The earliest instance that I know of, that seems worthy of serious consideration, is that of Dr. Brown-Séquard's epileptic guinea-pigs, because it admits of verification; but this, if I understand his account rightly (Proceedings of Royal Society, x. 297), is open to some objection. It appears that Dr. Brown-Séquard found, during his researches into the cause of epilepsy, that, by

a particular operation on the spinal cords of guinea-pigs, he could induce a convulsive disease very much like epilepsy. He operated upon many guinea-pigs, and kept them apparently apart from the rest of his stock, and noticed that their young were at times attacked with "epileptiform" convulsions, while the young of the rest of his stock never were; hence he concludes that the artificially induced epilepsy was transmitted hereditarily. My objection to this conclusion is, that if persons were brought up from childhood in a ward of epileptic patients, they would certainly acquire a tendency to epileptiform seizures by the mere effect of imitation. It is notorious that many an epileptic person has had his fits first brought on by witnessing the epileptic seizure of another. This, however, may be an unfounded objection, due, as has just been remarked, to misapprehension of an experiment, whose details deserve a fuller description. It is much to be regretted, that two subsequent memoirs, read by Dr. Brown-Séquard at the British Association in 1870, do not appear to have been published; their titles only are to be found in its Journal (p. 134). But he has communicated a most important *résumé* of other results to the *Lancet* (Jan. 1875, p. 7) regarding the inheritance of certain purely physical effects that were produced on the parent guinea-pigs by nerve-mutilation, and their occurrence in the offspring, in the same order in which they had appeared in the parents.

A special cause may be assigned for the effects of disuse in causing hereditary atrophy of the disused parts. It has already been shown that all exceptionally developed organs tend to deteriorate; consequently those that are not protected by selection will dwindle. The level of muscular efficiency in the wing of a strongly flying bird is like the level of water in the leaky vessel of a Danaid, only secured to the race by constant effort, so to speak; let the effort be relaxed ever so little, and the level immediately falls.

In addition to much else that might be said in disparagement of evidence on which overmuch reliance has hitherto been put, we should recollect that it is hazardous to adduce the very gradual adaptation of a race to changed conditions as a proof that acquired habits are hereditarily transmitted, because when several generations elapse before any appreciable result can be observed, selection will have had many opportunities of operating. It is indeed hard to find evidence of the power of the personal structure to react upon the sexual elements that is not open to serious objection. That which appears the most trustworthy, lies almost wholly in the direction of nerve changes, as shown by the inherited habits of tameness, pointing in dogs, and the like, and the results of Brown-Séquard.

The conclusion to be drawn from the foregoing arguments is, that we might almost reserve our belief that the structural cells can react on the sexual elements at all, and we may be confident that at the most they do so in a very faint degree; in other words, that acquired modifications are barely, if at all, *inherited*, in the correct sense of that word. If they were not heritable, then the second group of cases would vanish, and we should be absolved from all further trouble about them; but if they exist, in however faint a degree, a complete theory of heredity must account for them. I propose, as already stated, to accept the supposition of their being faintly heritable, and to account for them by a modification of Pangenesis. Each cell may be supposed to throw off a few germs that find their way into the circulation, and thereby to acquire a chance of occasionally finding their way to the sexual elements, and of becoming naturalised among them. In illustration of this process, we may recur to political metaphor, and imagine the stirp to be represented by some country, and the germs by its inhabitants. We know that, in every country, travellers from other nations occasionally find a place, which they can fill more suitably than at their own homes or elsewhere, and they become settlers. The population of the country may be as highly organised as it is needful to consider the sexual elements to be; every trade and profession may seem to be full; and yet the stranger obtains a lodgment, either through superiority or luck. He may displace one of the native-born inhabitants, or he may find an unoccupied corner which he can fill; anyhow, as a matter of fact, he becomes a permanent citizen.

The hypothesis of organic units enables us to specify with much clearness the curiously circuitous relation which connects the offspring with its parents.* The idea of its being one of direct descent, in the common acceptance of that vague phrase, is wholly untenable, and is the chief cause why most persons seem perplexed at the appearance of capriciousness in hereditary transmission. The stirp of the child may be considered to have descended directly from a part of the stirps of each of its parents, but then the personal structure of the child is no more than an imperfect representation of his own stirp, and the personal structure of each of the parents is no more than an imperfect representation of each of their own stirps. The political analogy to the common, but false, idea of the filial relationship is that which connects colonists to their parent nations: the relationship, according to the views in this memoir, is much more circuitous and feeble; it resembles that which connects the *representative government* of the colony with

* I endeavoured to explain this in a paper, *Proc. Royal Soc.*, 1872, p. 394.

the *representative governments* of the parent nations. This, at least, is a first approximation: the second approximation consists in making allowance for the small power that exists, of transmitting acquired peculiarities; that is, for the power of the personal structure to react upon the sexual elements, and thereby upon the future stirp. To effect this, the analogy may be revised by supposing the governments of the parent states to have the power of nominating a certain proportion of the colonists.

It now remains to summarise briefly. I began by showing that certain postulates were admitted by most biologists, and that they gave a firm base whereon to develop a theory of heredity. By these, and by what appear to be their necessary consequences, I explained the object of double parentage, and therefore of sex. Then I dwelt on the restless movements of the germs in the stirp and the variety of their attractions and repulsions. Next I explained how it arose, that brothers or sisters were often very dissimilar; also, on other grounds, why twins derived from the same primary stirp were either very much alike or extraordinarily contrasted (this being a fact that had resulted from inquiries of my own). Then, I spoke of individual variation. Then, I argued that the developed part of the stirp was almost sterile, and that it was from the undeveloped residue that the sexual elements were derived. By this, I explained the almost complete non-transmission of acquired modifications; also the occasional deficiency in the offspring, of qualities for which the parent had been exceptionally remarkable, and for certain diseases skipping alternate generations. The theory was proposed that the successive segmentations of the stirp were not perfectly clean and precise, but that each structure included many alien germs, whereby the progeny of all the contents of the residue of the stirp were distributed over the body. This accounted for much that Pangenesis over-accounted for, and was free from objections raised against the latter.

The assumed evidence that structural changes reacted on the sexual elements was then discussed, and it was pointed out that certain changes were really collateral which had been commonly thought to be effected by inheritance. Some of the evidence that structural changes might react on the sexual elements was, however, accepted, and to account for its existence, a modification of Pangenesis was adopted; each nascent cell being supposed to throw off germs which occasionally found their way into the circulation, and ultimately obtained a lodgment in the already constituted sexual elements; this process being therefore independent of and subordinate to the causes which

were supposed mainly to govern heredity. Finally, the exact relationship was defined, which connects the parents with their offspring.

Mr. Rudler read a report on Anthropology at Bristol, as follows:—

REPORT on the DEPARTMENT of ANTHROPOLOGY at the BRISTOL MEETING of the BRITISH ASSOCIATION for the ADVANCEMENT of SCIENCE, 1875. By F. W. RUDLER, Secretary of the Department.

THOSE of our members who were present at the Bristol Meeting may fairly look back with unmixed feelings of satisfaction at the part which their science played on that occasion. Year after year the claims of anthropology to take rank among the natural-history sciences come to be better understood and more definitely recognised; and although it is perhaps scarcely possible to altogether exclude papers of an empirical character, it is yet matter of congratulation that there is a notable increase in the number of communications by men who are competent to apply strictly scientific methods to the discussion of anthropological problems. But whilst a large proportion of the papers read at Bristol were undoubtedly of sterling value, and, therefore, sufficient to ensure success at any meeting, no one could shut his eyes to the fact that the exceptional success of the Bristol gathering was traceable to the admirable way in which the proceedings were conducted by the distinguished chairman. In Professor Rolleston, the anthropologists found a leader who, while coupling profound science with masterly scholarship, displayed rare tact in the management of a meeting. The general body of members of the Association is not slow in learning where the greatest attractions are to be found, and hence the audience which gathered in Professor Rolleston's department soon grew too large even for the fine room at the Royal Hotel which had been placed at our disposal. Indeed, so strong and popular were the anthropologists at Bristol, that it was suggested by the president of the Section that the time was come when anthropology should cease to hold the dependent position of a department, and should be raised to the rank of a separate section. Although this suggestion might appear on the face of it to be advantageous to our science, it was decided, after mature discussion in committee, that it would be inexpedient to recommend action in this direction. In fact it was felt that the scientific position of anthropology would be best insured by retaining its association with the older biological sciences, and that, if severed from these, there might be danger of reversion

to its pre-scientific stage. But although it was thus believed that the interests of anthropology would be best served by allowing it to retain, for some time to come, its dependence on the collateral sciences, the discussion was not allowed to close without benefit to our department; and a scheme of recommendations for facilitating its future management was drawn up by Mr. John Evans. It has been found in the practical working of the department that the committee is greatly hampered by its complete subordination to the committee of the Section. After the business which is supposed to be common to the three departments has been transacted, the time left to the sub-committee is too limited for its special work, and, consequently, the merits of the papers presented are often insufficiently discussed. Greater freedom of action has, therefore, been conceded to the sub-committee, which will, in future, be solely responsible for the internal working of the department, the sectional committee being consulted only on questions involving grants of money.

This allusion to financial matters may be fitly followed by a reference to the liberal way in which the committee of recommendations showed itself willing to forward anthropological investigations. Indeed, no fewer than five grants, involving the disposal of £350, were made on this occasion for researches bearing upon anthropology. The committee for preparing and publishing instructions to travellers was re-appointed, with Colonel Lane Fox as secretary, and a grant of £25 was made for additional expenses to be incurred in the issue of an appendix; but it should be mentioned that an almost equivalent sum will be paid to the treasurer of the association as profit on the sale of this work, and that this sum will of course be increased as the sale extends, so that eventually the work may cover its own expenses. It may be remarked in passing that the value of this volume was so fully recognised by the sectional committee that Dr. Schlater, the president, expressed a wish that a similar body of instructions might be drawn up by zoologists for the guidance of travellers willing to assist in their branch of natural history.

It is satisfactory to state that a committee has been appointed for purposes of Prehistoric Archaeology, with Colonel Lane Fox as secretary, and with a grant of £25. Bearing in mind the interesting results which have recently been obtained by our president at Cissbury, there is full assurance that the grant will be profitably applied, and it is to be hoped that it will only be the forerunner of more important grants for like purposes.

The committee for exploring Kent's Cavern was re-appointed, with Mr. Pengelly as secretary, and its grant of £100 was

renewed. Although this grant goes to the account of the geological section, the anthropologists share largely in the benefit of the results, and Mr. Pengelly at the recent meeting was good enough to bring his latest researches before our department.

In like manner the Settle Caves Exploration Committee was re-appointed, with Mr. Tiddeman as secretary, and the annual grant of £50 was this year raised to £100. It is worthy of note that last year's exploration of the Victoria Cave has been unusually successful, and has yielded a remarkable collection of organic remains, which Professor Busk has described. Mr. Tiddeman concluded his report with a reference to the evidence which the cave has yielded as to the probable existence of man in Yorkshire prior to the glacial period.

In the Statistical Section, Anthropology found sufficient supporters to secure the appointment of an Anthropometric Committee, which appears to have been the direct issue of the suggestions which Dr. Beddoe made in a paper read to this Section "On the Physical Characteristics of Englishmen." The specific object of the committee, which is aided by a grant of £100, is the collection of systematic observations of the heights, weights, and other physical characters of the inhabitants of the British Isles. When it is said that Mr. Francis Galton has undertaken the secretaryship, it is unnecessary to add that valuable scientific results may be fairly expected from the labours of this committee.

In reviewing the public proceedings of the department, the first place should undoubtedly be assigned to Professor Rolleston's Address, although this was not delivered until the second day of the meeting. As it is not the practice of the Institute to print the British Association address in its Journal, it may perhaps be allowable to refer to it in this place at greater length than to any of the other communications to the department.

After some introductory observations, Professor Rolleston enumerated a few of the papers which would be submitted to the department, and in doing so was led to touch on the question of "the possibility of rescuing the inhabitants of Polynesia from that gradual sliding into extinction which some writers appear to acquiesce in as the natural fate of such races." Of this question he took a most encouraging view, looking hopefully to the future of the native races, and dropping meanwhile a cheering word to the missionary in his efforts to civilise. By quotation from Dr. Gerland, he showed that the Polynesian populations are not now suffering as rapid a decrease as in the first half of this century, and that in some localities the indigenous population is not only not diminishing, but is actually on the increase; facts which are supported by the authority of the Rev.

A. W. Murray and other residents in Polynesia. In criticising Mr. Bagehot's assertion, "that savages did not formerly waste away before the classical nations, as they do now before the modern civilised nations," Professor Rolleston reminded us that it was extremely unsafe to affirm the non-existence of a thing from the fact that we find no reference to it by contemporary writers. A citation, however, from the Book of Job, descriptive of a perishing barbarian race, was held to prove that savages must have wasted away, even at the early date of this writing.

"There is no need," says Professor Rolleston, "with such actual *veræ causæ* at hand, to postulate the working of any 'mysterious' agency, any inscrutable poisonous action 'of the breath of' civilisation. What is mysterious to me is not civilisation, but the fact that people who are in relation with it do not act up to its behests. And what is the mystery to me is not how an epidemic can, when introduced amongst helpless Polynesians, work havoc, but how it is that epidemics should be allowed to do so here in England from time to time."

Turning to the subjects of craniology and craniography, the President referred to the two opposite views which are taken of the ethnological value of skull-measuring, and pointed out what he conceived to be the true limits of this branch of inquiry. He condemned the rashness of founding ethnical conclusions on the examination of one or two skulls, and dilated on the difficulties of craniographical researches, when directed to the examination of mixed races.

"The largest result which craniometry and cubage of skulls have attained is, to my thinking," says Professor Rolleston, "the demonstration of the following facts, viz. :—first, that the cubical contents of many skulls from the earliest sepultures from which we have any skulls at all, are larger considerably than the average cubical contents of modern European skulls; and secondly, that the female skulls of those times did not contrast to that disadvantage with the skulls of their male contemporaries which the average female skulls of modern days do, when subjected to a similar comparison.* Dr. Thurnam demonstrated the former of these facts, as regards the skulls from the Long and the Round Barrows of Wiltshire, in the 'Memoirs of the London Anthropological Society' for 1865; and the names of Les Eyzies and Cro-Magnon, and of the Caverne de l'Homme Mort, to which we may add that of Solutré, remind us that the first of these facts has been confirmed, and

* "The subequality of the male and female skulls in the less civilised of modern races was pointed out as long ago as 1845, by Retzius in Müller's 'Archiv,' p. 89, and was commented upon by Huschke, of Jena, in his *Schädel, Hirn, und Seele*, pp. 48-51, in 1854."

the second both indicated and abundantly commented upon by M. Broca."

In explanation of the first of these two conclusions the President remarked that the oldest skulls with which we are acquainted are probably those of the chiefs of their tribes, and that the chiefs may have been elected to their position by virtue of their superior energy and ability. The greater brain-capacity of the chiefs may be further connected with their improved nutrition, since they generally obtain a larger share of food and material comforts than persons of ordinary rank.

With reference to the subequality of the skulls in the two sexes in prehistoric times, Prof. Rolleston cited Broca's explanation, which refers it partly to the greater severity of the struggle for existence, and partly to the less degree to which the principle of division of labour was carried out in those days. "This," says the President, "is an adequate explanation of the facts; but to the facts as already stated, I can add from my own experience the fact that though the female skulls of prehistoric times are often, they are not always equal, or nearly, to those of the male sex of those times; and, secondly, that whatever the relative size of the head, the limbs and trunk of the female portion of those tribes were, as is still the case with modern savages, very usually disproportionately smaller than those of the male."

After expressing his belief that the modern doctrine of "occipital dolichocephaly" will not bear the test of criticism, and duly rendering reasons for such belief, Prof. Rolleston enumerated some of the recent memoirs on craniology, and offered tribute to the memory of Pritchard, "the father of modern anthropology," a tribute which was peculiarly graceful in the city of Bristol, and which formed the text of some remarks by Dr. Carpenter at the conclusion of the address. A reference to the improved status of archaeology, which, by its adoption of natural-history methods, is passing to the rank of a science, led Prof. Rolleston to his concluding remarks, in which he dwelt on "the possible curative application of some of the leading principles of modern anthropology to some of the prevalent errors of the day." Did space permit, it would be well to transfer the fine closing passages to these pages, but even this transference would fail to convey the effect which their brilliant delivery produced, and which was well acknowledged in the remarks of Mr. John Evans and Col. Lane Fox, in proposing and seconding the vote of thanks which the President's address so well merited.

During the five days on which the Anthropological Department held its sittings, nearly thirty papers were either read or

taken as read; but it is not the purpose of the reporter to enter into any detailed analysis of this mass of matter. At the present time the Institute is fortunate in possessing a large number of original communications, including several of great value, and it would, therefore, be unjustifiable to occupy the time of the meeting, or the pages of the Journal, with a tedious report on other people's work. In the present case, too, there is the less necessity for this course, as almost all the papers which were of real merit have been secured for the Institute—thanks to the energy of Col. Lane Fox—and will, therefore, be probably read in this room during the present session. Under these circumstances the reporter believes that he will best meet the wishes of the Council, from whom he has received instructions to draw up this report, by limiting his notice of the papers to the briefest possible references.

The proceedings of the department were opened by Mr. Pengelly, who pointed out an error into which Mr. Karr Callard had fallen, with reference to the cast of an implement which he had obtained from the proprietor of Brixham Cavern. It appears that the original was a stone implement from the north of Ireland, and not, as had been asserted, from Brixham. Dr. Beddoe followed with some notes on the ossuary at Rothwell, in Northamptonshire, and expressed his opinion that the bones had been removed at an early date from the churchyard. Mr. Phené discoursed on the works, manners, and customs of the early inhabitants of the Mendip Hills, and illustrated his remarks by some excellent diagrams. In a paper on prehistoric culture in India and Africa, Mr. Hyde Clarke argued in favour of an early community of culture between the two countries, basing his argument on the comparative study of the aboriginal languages of India with those of Africa.

After the delivery of Prof. Rolleston's address on Friday, Miss Buckland read an interesting paper "On Rhabdomancy and Belomancy," in which she sought to trace the origin of divination by means of rods and arrows, and regarded it as a survival of a Turanian or pre-Aryan faith, which might possibly be useful as a test of race. Mr. John Evans explained the international code of symbols which have been prepared for use on archaeological maps by the sub-committee appointed at the Stockholm meeting of the Congress of Prehistoric Archaeology. The results of the recent explorations in Cissbury Camp, which represent the first-fruits of the work of our Exploration Committee, were brought forward by Col. Lane Fox, whilst Prof. Rolleston described the animal remains, including the skeleton of an ancient British lady.

On Saturday morning Mr. Groom Napier read a note on the

localities whence the tin and gold of the Ancients were derived. Then followed several Indian papers, including Sir Walter Elliot's valuable communication on the original localities of the races which form the present population of India. Dr. Leitner discoursed with his usual fluency on the results of his ethnological and linguistic tour in Dardistan, and illustrated his remarks by a number of objects of ethnological interest, including a selection of his Greco-Buddhistic sculptures. Mr. Bertram Hartsorn contributed an original paper on the Veddas, whom he had studied in Ceylon; whilst Mr. Hyde Clarke discussed the Himalayan origin of the Magyar and Finn languages. The Rev. Wyatt Gill spoke briefly on the traditions of the Hervey Islanders—a people with whom he was well acquainted by long residence among them. In the absence of the author, Mr. Robert Mitchell's paper on "The Antiquity and supposed Lost Language of the Kirghiz" was taken as read.

On Monday morning Mr. Pengelly opened the proceedings by an interesting description of the archæological discoveries in Kent's Cavern. Professor Rolleston then read a short paper on "The Applicability of Historical Evidence to Ethnographical Inquiries," which was fitly followed by Canon Rawlinson's communication on "The Éthnography of the Cimbri," the author arguing in favour of their Celtic origin as stoutly as Mr. Freeman insisted on their Teutonic affinities. Finally, the Rev. Professor Earle read a paper on "The Ethnography of Scotland," in which the Danish element in the Lowland Scots was brought into prominent relief.

On Tuesday, the last day of the meeting, Mr. Mackintosh had a paper on "Anthropology, Sociology, and Nationality." Col. Carrington described the Indians of the North Western United States, delivering his remarks with great effect, and giving some interesting illustrations of gesture-language among these Indians. The Rev. Mr. Gill's note on "The Origin of the South Sea Islanders" was followed by a long memoir by Mr. Vaux on "The Probable Origin of the Maori Race," a subject on which light was thrown by the remarks of Dr. Hector, who is at present in this country. Mr. Park Harrison briefly called attention to his photographs of incised tablets from Easter Island, whilst Dr. Gladstone exhibited a flint flake which he had recently found in the brick-earth pits at Erith, in Kent. As the last day of the meeting was now well advanced, the remaining communications were taken as read. These included a paper by Mr. Wake on "The Predatory Races of Asia and Europe"; one by Mr. Hyde Clarke on "Prehistoric Names of Weapons"; another by Dr. Nicholas on "A New Paragraph in English History"; and finally, one by Mr. Hodder Westropp

on "The Cycle of Development." The proceedings closed with a warm vote of thanks to Professor Rolleston, proposed by Sir W. Elliot, and seconded by Mr. Phené.

Although this terminated the business of the meeting, so far as the Anthropological Department itself was concerned, it may not be out of place to refer to some other ways in which the interests of our science were served at Bristol. Thus it would be ungraceful to omit reference to the handsome volume which had been prepared by the local committee in view of our visit, and was liberally presented to members of the general committee of the Association—a volume which contains a vast amount of trustworthy local information, both historical and scientific, including a chapter on the Anthropology of the district, by Dr. Beddoe. Nor should we omit allusion to the excellent arrangements of the temporary museum, under the care of Mr. J. E. Taylor, in which the objects exhibited at our meeting, such as Col. Fox's instructive model of the Cissbury excavations, might be conveniently examined at leisure.

Advantage was taken of the visit to Bristol by several anthropologists to examine some of the neighbouring prehistoric antiquities. The partial destruction of the old camp of Borough Walls, in Leigh Woods, attracted the attention of Col. Fox, who has since co-operated with Dr. Beddoe with the view of yet preserving a portion of these remains; and it is hoped that their action, supported as it has since been by the Council of the Institute, may successfully compass this end. It is perhaps not travelling beyond the reporter's province to mention that the megalithic remains of Stanton Drew, Avebury and Stonehenge, were included among the places of interest to which excursions had been organised by the local committee. But it may be fairly doubted whether much light was thrown upon prehistoric archaeology by these visits. Indeed our megalithic remains appear to have been rather abused at Bristol. Thus the President of the Association, in his opening address, gave his partial adhesion to Mr. Fergusson's view of the post-Roman origin of many of these monuments; in the official programme of excursions they were all referred to under the popular designation of "Druidical remains"; and in the report of the excursion to Avebury we are told that the reverend gentleman who conducted the party gravely carried the history of the stones "as far as the time of Abraham, when he believed the Avebury pile was in its glory, a period 700 years before the Stonehenge stones had been hewn" (*Western Daily Press*, Sept. 3, 1875). This ascription of our finest megalithic remains to definite dates would hardly need remark, were it not that in certain quarters there is danger of mistaking rashness

of ignorance for accuracy of knowledge. Such facts show that although so much has of late years been written on this subject, there is yet much need for the dissemination of what we believe to be sounder views—an end which can perhaps be nohow better effected than by a wider circulation of the publications of the Anthropological Institute.

In the discussion which followed the reading of Mr. Galton's papers, Mr. NOYES, Mr. CHARLESWORTH, Dr. RICHARD KING, Professor BUSK, and the PRESIDENT, took part. The PRESIDENT also offered some remarks upon Mr. Rudler's report, and the meeting separated.

NOVEMBER 23RD, 1875.

Colonel A. LANE FOX, *President, in the Chair.*

The minutes of the previous meeting were confirmed.

The election of J. W. SIMPSON, Esq., of Jaffna, Ceylon, as an ordinary member, was announced.

The list of presents was read and the thanks of the meeting were voted for the same:—

FOR THE LIBRARY.

From the EDITOR.—*Revue Scientifique.* Nos. 20 and 21, 1875.

From the ASSOCIATION.—*Proceedings of the Geologists' Association.* Vol. IV. No. 4.

From the Rev. W. CARRUTHERS.—Photograph of the "Marias," a wild tribe living in the woods and jungle near Chanda, India.

From the SOCIETY.—*Transactions of the Watford Natural History Society.* Vol. I. Part 2.

From the AUTHOR.—*Flint and Chert Implements found in Kent's Cavern, Torquay; Geology and Palæontology of Devonshire, Part II.; Memoranda, Part I.* By W. Pengelly, F.R.S.

From A. R. WALLACE, Esq.—*The Dierjerie tribe of Australian Aborigines.* By Samuel Gason, Police Trooper.

From the AUTHOR.—*The Indian Tribes and Languages of Costa Rica.* By Wm. M. Gabb.

From the SOCIETY.—*Journal of the Asiatic Society of Bengal, Part I. No. 2.; Proceedings of ditto.* Nos. 7 and 8, 1875.

From the SECRETARY OF STATE FOR INDIA IN COUNCIL.—*Census of the Bombay Presidency, taken on the 21st February, 1872.* Part III.

The following report was read by the PRESIDENT (A. W. FRANKS, Esq., F.R.S., Vice-President, in the Chair):—

EXCAVATIONS in CISSBURY CAMP, SUSSEX; *being a REPORT of the*
EXPLORATION COMMITTEE of the ANTHROPOLOGICAL INSTITUTE
for the year 1875. By Col. A. LANE FOX, President A. I.
[With Plates xiv. to xix.]

OUR knowledge of Cissbury and of the ancient Flint Mines associated with it has been, like all other knowledge, a work of slow and gradual development, to which there have been many contributors, each of whom, guided by the archæological attainments of his age and the experience of his predecessors, has done his best to throw light on the origin and history of this remarkable earthwork. Amongst ancient camps the largest in this part of England, situated on a commanding eminence three miles north of Worthing, on an expanse of down and juniper not yet reclaimed in modern times by the plough, though cultivated in Roman or pre-Roman times, as the terraces on the hill-sides show—visible from the railway and from the surrounding country for some miles, and overlooking within easy signalling distance, if such were needed, the neighbouring camps of Chanktonbury and Highdown—commanding also a continuous view of more than sixty miles of coast stretching out beneath in the form of a bow, as seen from the arrow's point, the white cliffs of Beachy Head and Seaford on the east, the low ground of tertiary formation extending from Brighton and Worthing to Selsea Bill on the west, and the thin spire of Chichester, beyond which may be seen, and of ill-omen when seen, as predicting certain rain on the morrow, the chalk cliffs of Brading, in the Isle of Wight—this place, from these causes, has always been a point of attraction to sight-seers. But it is not until lately, not, I may say, until now, that our excavations have been the means of establishing, by the position of this entrenchment, two distinct points of sequence in the culture of prehistoric man, that it has become one of special interest to anthropologists.

Amongst the earliest of our fellow-workers here may be mentioned no less an antiquary of note than Camden, who, in his "*Britannia*," speaks of this camp as the work of Cissa, the Saxon king of these parts, from whom, in his opinion, and in great probability, it derives its name of Cissbury, but not its origin, as recent discovery has clearly proved. Camden's opinion, although the best of its time, is not of much use to us now. To be nearer in point of time to the subject of inquiry is of no advantage when dealing with matters of such great antiquity; expectation should rather be in an inverse ratio to the time, for each day adds something to the means we have of

finding out the truth in all that relates to the manners and customs of our prehistoric ancestors, if they were our ancestors, which moot point I do not mean to discuss now.

In a paper published seven years ago in the "*Archæologia*,"* I have endeavoured to do justice to those who wrote on Cissbury during what may be termed the pre-scientific period of archæology, in the days when all knowledge was supposed to be stored up in books, and the art of seeing what there was to be seen had been comparatively little cultivated, and amongst them I have assigned a place of honour to Mr. Irving, not so much on account of anything he found in Cissbury, or of any conclusions that he came to on the subject, but because he was the first to dig into the pits there and record the results of his examination of them, thereby asserting the principle of inquiry by original observation, to which mode of investigation we are indebted for all subsequent discoveries in this place. As, however, Mr. Irving wrote during the pre-scientific, or, in other words, pre-anthropological age of archæology, he took no notice of flints, and it is owing to the existence of a flint implement factory here that Cissbury merits our particular attention at this time.

I may, therefore, omit all special mention of previous investigations, and commence what I have to say with the discovery of this flint implement factory, which was made by myself in the year 1867, and recorded in the paper to which I have referred, and which was read to the Society of Antiquaries in February, 1868.†

If I were asked to select from amongst the discoveries of modern anthropologists the one which appeared to me to have been most fruitful of interesting results, I should select for the post of honour the first discovery of the form and peculiarities of a flint chip, and I would include amongst the contributions to this discovery, firstly, the observations of modern travellers on the mode of working flint implements amongst existing savages, by Catlin and Burton in North America, by Belcher amongst the Esquimaux, and by Bains amongst the Australians. Secondly, the application of the knowledge thus obtained by modern anthropologists, and by Mr. Evans in particular, to the determination, by means of experiment, of those forms and modes of fracture by which we are enabled to recognise at a glance and with certainty, the smallest chip of flint flaked by the hand of man, from those which, split by natural causes, cover the surface of the ground.

* xlii. p. 53.

† The finding of a single flint celt in Cissbury was recorded in the *Sussex Archaeological Collections* some years before, but this led to no further discovery. *Suss. Arc. Coll.*, ii. p. 268.

To our knowledge of flint chips at the present time, and our ignorance of them in the past, we are indebted for the greater part of our prehistoric discoveries. To our ignorance in the past, because it is owing to this ignorance that these chips have been allowed to remain unnoticed and untouched in the very spots in which they were struck off thousands of years ago.

It is by our power of identifying these most abundant relics of primeval man now, that we are led to the spots where further evidence of him may be discovered. By them we know where to look for palæolithic man in the drift gravels, and to determine his place in sequence by the deposits which overlay them. By means of flint chips we can distinguish on the surface of the ground the workshops, the camps, the mines, the villages, and as we cast about the hills we are enabled by means of them, like boys in a paper chase, to hunt up neolithic man in all his old abiding places. All this, be it observed, the modern anthropologist is able to do in places where the antiquary of old could see nothing at all.

As an old sportsman I commend flint hunting to all anthropologists who have not practised it. As a healthy exercise it is fully entitled to a place amongst field sports, and in its objects it is far higher, for whilst the sportsman pushes forward to be in at the death, the goal of the flint hunter is to be in at the birth of a fresh discovery. My discovery of this flint factory, if it was but a little one, was nevertheless a birth, introduced by such pains as a month of continuous walking over the Sussex downs might entitle me to, and for which I considered it an ample reward.

During that month I examined and measured fifteen camps, walked over a considerable area of cultivated ground, and came to the conclusion that the majority of the camps are associated in an especial manner with the existence of flint flakes and other prehistoric flint implements which are found on the surface in the interior of them. Since then my attention has been drawn by Mr. Evans to the fact that a great part of the surface of the chalk cliffs on the coast line between Seaford and Beachy Head is covered with these remains of the prehistoric flint workers, and having walked with him over a great part of this ground, I have been induced to alter my opinion in so far as the two ancient earthworks of Seaford and Beltout are concerned.

In this region the *débris* of flint manufacture is so far abundant on the surface, and especially near the edge of the cliff, that the fact of finding flint flakes in the interior of these entrenchments is no proof whatever of their being of the age of these entrenchments, they may have belonged to the soil on

which the entrenchments were afterwards constructed. But this does not apply to other parts of the Downs of Sussex and elsewhere. There, worked flints are found in patches here and there; but considerable distances may be traversed without coming to these patches, and the fact of finding them in unusual numbers in the insides of these earthworks remains to testify to the probability of their having been used by the inhabitants of them.

Two objections may be raised. It may be said that the insides of the camps have been better searched than other parts, and hence their special association with the flints may be more apparent than real, or it may be said that the same sites were often occupied during successive ages. But these camps are situated on the tops of high hills, in places which, being remote from fuel and water, would not have been occupied except for the purposes of defence. I am therefore still prepared to believe that on further investigation some, though not all of them, will be found to have been erected by people either of the stone age or of some subsequent prehistoric period, during which flint still continued to be used for implements.

In the Camp of Cissbury I found that the number of flint flakes found on the surface were in excess of those found in other camps, such as the Devil's Dyke, Hollingbury, Chanktonbury, Beltout and Seaford, and chiefly in the neighbourhood of a collection of large pits which filled the interior of the camp on the west side. In September, 1867, and again in January, 1868, I excavated a number of these pits, and found in them, at from four to five feet from the surface, a large number of flint tools, the majority of which appeared to be unfinished, but some of which were probably finished specimens. The result of these excavations led me to the following conclusions, which I quote from my paper. After considering the several theories which had been advanced at different times for the use of the pits—such as their being tanks for water, pounds for cattle, or habitations for the men—I said, "For what purpose then were they constructed? I am inclined to think for the purpose of obtaining flints for implements. It is said that the flint is more easily worked when it is first removed from the chalk, and this would be a reason for excavating the pits." The animal remains I found were chiefly those of domesticated species,* and I attributed the flint factory to the neolithic age; but pointed out that amongst the types of implements found in the pits there

* The following were identified by Mr. W. Davies, of the British Museum, viz.:—*Cervus elaphus*, *Bos longifrons*, *Capra hircus*, *Equus* (sp. ?) and *Sus scrofa*; no trace of fallow deer. The shells were *Littorina littorea*, *Cyclostoma elegans*, *Tapes decussata*, Linn., *Helix nemoralis*, Linn.

were some which were distinctly allied to palæolithic forms. I also noticed that in the lower parts of the excavations, some of the flints retained the unaltered blue colour of the flint, whilst those found near or upon the surface were whitened by exposure to rain and air.

This was, I believe, the first recorded notice of pits dug for this purpose in this country. Although, as I have since learnt, M. M. C. Malaise had in the previous year, 1866, noticed the existence of ancient pits at Spiennes in Belgium, I was not aware of this at the time of my excavations in Cissbury, and I had not therefore the advantage which his experience would have afforded to guide me in my investigations. To this circumstance it must be attributed that I failed to discover at that time the great extent of these excavations. I was deceived by the hardness of the upper surface of the chalk rubble, consolidated by ages of exposure to moisture from the surface, and led by its close resemblance to the rubble of natural formation, which overlies the chalk everywhere, to suppose that I had reached the bottom when in reality I had, as I afterwards found, only reached in some cases the tops of deep shafts. My reason for assuming that the pits were dug for flints was on account of the great number of flint nodules found in them, which could have come from no other place, and which were mixed with finished and partly finished implements in great abundance, which had obviously been fabricated out of similar nodules. Nor did it appear to me at all necessary to dig deeper for the flints. Some of the pits were as much as 20 feet deep, counting the excavations that I made in them, and there is no superficial deposit of eocene clay above the chalk, which here reaches everywhere to the surface.

In a quarry near Broadwater, where the chalk is on the same, or nearly the same, plain of the middle chalk formation, rising at the same angle northward, the flints are seen in seams at from 3 to 6 feet apart, beginning close to the surface. The Cissbury pits therefore appeared to me quite deep enough to get at them, and this has been confirmed by the most recent of the excavations. The premises therefore were sufficient to justify the conclusion arrived at, although, as will be seen hereafter, I left it for others to discover the extent of the pits and the galleries branching from them. Canon Greenwell also excavated several of these pits in 1868, and with similar results to mine.

In order to continue the history of the discovery of these flint works, it is now necessary to turn to Belgium.

At Spiennes, near Mons, a similar flint factory to that of Cissbury had been noticed as early as 1847, and in 1860 M.

Albert Toilliez described the superficial *débris* of the flint workers, and gave his opinion that they belonged to the surface period, an opinion which, on account of the form of the flint implements, was, I believe, shared by both M. Evans and M. Mortillet. The strata of the soil here, however, differs from that of Cissbury, and throws difficulties in the way of determining the age of the flint works which are not met with at the latter place. The chalk at Spiennes, instead of coming to the surface as at Cissbury, is overlaid by quaternary deposits containing remains of *Elephas primigenius* and *Rhinoceros tiehorrhinus*, together with flint implements of palæolithic age, and this again by an alluvial deposit (*Limon supérieur*, and *Limon inférieur*). Having ascertained that flint implements were found in the quaternary deposits which rested upon the chalk, M. Malaise, in a paper published in 1866, came to the opinion that the whole of the worked flints found at Spiennes belonged to this quaternary deposit, and stated his belief that they were found on the surface only in those places where, the alluvium being absent, the quaternary deposits cropped out on the surface.

But the true nature of these flint works was only found out gradually, and, like many other discoveries of a similar kind, as the result of accident. Shafts 15 metres deep had been sunk through the superficial deposits into the chalk, and galleries driven from them for the purpose of obtaining flints for a manufactory of Faience close by. Whilst thus employed the workmen came upon other similar shafts and galleries of ancient date, which had been filled up to the top with rubble, and in which many flint implements and some human remains were found.

In two years as many as twenty of these ancient shafts were discovered, and M. Malaise was led by them to the following opinion, with which he concludes his pamphlet.* “Ces anciens puits, remplis de débris, n'ont ils pas servi à l'extraction des silex bruts dont on a fait ces haches? Les restes humaines n'appartiendraient ils pas aux tailleurs de ces silex?” Still, however, M. Malaise was of opinion that the flint factory was of the palæolithic age, and was anterior to the alluvium. It remained for Messrs. Cornet and Briart to determine the true age of the factory, and again this was brought about through the medium of modern engineering operations.

In constructing a railway from Frameries to Chimay, about the same time that my excavations in Cissbury were going on, a deep cutting 200 metres in length was made through the ground at Spiennes, and twenty-five of these shafts with

* “*Sur les silex ouvres de Spiennes*,” par M. C. Malaise, Bruxelles, 1866.

galleries were cut through. By this means it was seen that the shafts passed upwards through the alluvium and extended to the present surface. This determined the age of the factory to be of the surface-period.

It may be useful to note the most remarkable results obtained by this excavation in order to compare them with those of Cissbury. The shafts were circular, of small diameter, from 0·60m. to 0·80m. across, and filled up to the top with chalk rubble. They were frequently *quite close together*, and often arranged in lines, but whether this was accidental or intended to mark the direction for the galleries beneath, the investigators were unable to determine. The galleries were irregular, from 0·50m. to 2m. high, and from 1m. to 2·50m. broad, running along the seams of flint, and they were partially filled in by hand, and with chalk rubble probably obtained from other pits. The galleries all ran obliquely to the railway cutting, which was east and west, so that a section of them only was seen in the line of the cutting. The greater part of the worked flints were imperfect, but some were perfect; they were found in the shafts, galleries, and on the surface, whilst others of greater antiquity were found, as already said, in the stratified quaternary deposits. Those found on the surface had a white patina over the flaked parts extending to a depth of one millimetre from the surface, and were sometimes coated in addition with a ferruginous oxide. Those found in the stratified quaternary deposits of older date had often a light grey patina, but were never white, whilst those found deep in the shafts and galleries were invariably of the unaltered blue colour of the flint, although in these the fractured portions could easily be distinguished from recent fractures. The flint was of superior quality. A human skull found in one of the shafts was *said to be of large size*. In a seam of charcoal, animal bones, and worked flints, some distance down in one of the shafts, a large fragment of *coarse hand-made pottery* was discovered. The animal remains were those of the hare, rabbit, hedgehog, brown bear, dog (probably domestic), cat, badger, polecat, otter, ox, goat, stag, elk, and wild boar. Implements of deer horn were also found in the shafts. The report of Messrs. Cornet and Briart was published in the "*Bull. Ac. R. Belgique*," and read at Bruxelles on the 1st Feb., 1868.

In 1870 Canon Greenwell examined one of a series of 254 pits, near Brandon, in Norfolk, known as Grimes Graves, the principal results of which were as follows:—The shaft was 39 feet deep, and 28 feet in diameter, the others varied from 20 to 65 feet in diameter, and were at an average of 25 feet apart. The shaft examined was cut through a deposit of 13 feet

of sand overlaying the chalk, and descended until a layer of flint of superior quality, known to modern flint workers as "floor stone," was reached. This layer is still worked for gun flints by means of shafts and galleries of similar form to the ancient ones. The galleries which ran along the seam of flints were from 3 to 5 feet high, and 4 to 7 feet in width, and they communicated with other shafts, forming a complete network of galleries. One of them was 27 feet in length. They were worked out by means of picks of deer horn, as many as seventy-nine of which were found; and also, as Canon Greenwell supposes, by means of flint tools, many of which were found in the excavations. The stag's horns were of larger size than those of the present red deer. All the shafts were filled in to within 4 feet of the surface with the materials from other shafts. Several chalk cups were found, which Canon Greenwell supposed to have been used as lamps. No trace of a polished implement was found anywhere in or about the shafts. No pottery was discovered. Stag's-horn implements were found, some of which had been cut round the surface with a flint, and then snapped off. The sides of the shafts were nearly perpendicular, only narrowing slightly towards the bottom. The people must have ascended and descended by means of ropes or ladders. The animal remains were chiefly those of domesticated animals, and consisted of red deer, small ox, goat or sheep, horse, pig, and dog; and from the form of the implements, Canon Greenwell attributes the whole of the works of Grimes Graves to the neolithic age.*

About two years ago Mr. Tyndall, of Brighton, following the clue already afforded by previous discoverers, opened one of the pits in Cissbury (L. fig. 1, Pl. xiv.), and having sunk beneath the superficial deposits in search for a shaft, found one 18 feet in diameter at top, narrowing to 10 feet at the bottom, which was 39 feet below the surface. Mr. Tyndall unfortunately died before he could make a proper record of his excavation. He, however, found in the shaft, for the first time in association with this or similar excavations, the remains of the large *Bos primigenius* in considerable quantities, also the wild boar; and the animal remains found in this shaft were, I believe, chiefly those of wild animals.† This circumstance, coupled with the fact now rendered probable, that my previous excavations had been confined to superficial deposits, led some persons to infer somewhat hastily that the whole of the works at Ciss-

* "Journal of the Ethnological Society of London." New Series. Vol. iii.

† Since then I have learnt from Mr. Boyd Dawkins, F.R.S., who identified these remains, that domesticated species were also found in this shaft. See his remarks at the end of this paper.

bury might be attributed to an earlier period than the neolithic; but this, it will be seen, has not been confirmed by more recent discoveries. Mr. Tyndall's shaft had no galleries leading from it.

Since then Mr. Ernest Willett has opened another shaft (K. fig. 1, Pl. xiv.) near the former one, 19 feet in diameter and 20 feet deep, having galleries at the bottom similar to those of Grimes Graves, a considerable portion of which were re-excavated and examined. Mr. Willett's paper, read to the Society of Antiquaries during the present year, not having as yet been published, I am unable to refer to it in the detail that I could desire. In point of animal remains, the evidence afforded by this excavation appears to have been very bare. Mr. Willett believes that he has ascertained by the existence of hard seams of rubble, evidence of successive periods in the filling in of this shaft. Perhaps the most interesting part of Mr. Willett's discovery consists in the occurrence of several bladebones of a small ox, and the suggestion by him that they were employed as shovels by the prehistoric men. I shall revert to this subject hereafter.

Both Mr. Tyndall's and Mr. Willett's shafts were found in a portion of the works which, though forming part of the same series of pits, were to the south of those examined by me, having been selected, as I understand from Mr. Willett, on account of their having been previously unexplored. Moreover, the depressions on the surface previously to excavation were very shallow, not being more than a foot or two as compared with the basins of 10 to 15 feet which I had examined in the more northerly portion of the series, and their diameters were proportionately small.

Notwithstanding this difference of form—a difference which, as we shall see hereafter, was not confined to the surface—I was led by the discoveries of Mr. Tyndall and Mr. Willett to re-examine some of my previous diggings; and having in June of this year (1875) re-opened one of the large pits explored by me eight years before, and likewise one of those which had been superficially examined by Canon Greenwell in 1868, I found that both extended to a greater depth than we had then supposed.

The general resemblance of the Cissbury flint works to those already described having now been satisfactorily determined, a question of still greater anthropological interest arose in the consideration of the relative age of the neolithic flint factory and the entrenchment in which it is situated. This entrenchment is one of the largest in this part of England. It has, as I have elsewhere described,* all the peculiarities of a British

earthwork; and the occurrence of the deep shafts and large pits in connection with it, afforded an opportunity of ascertaining definitely the age of the camps with reference to the stone period. Valuable as previous discoveries had already been, the opportunity thus afforded of establishing a sequence between these two distinct classes of prehistoric remains appeared to exceed them all in interest and importance.

I have already stated the superficial grounds on which I had hazarded a conjecture on this point, and I had applied myself more directly to the question in 1867, by opening a section in the ditch of the entrenchment on the west side (E. fig. 1, Pl. xiv.), the result of which is thus stated in my former paper:—"No trace of pottery or metal, or anything but a few bones and about five or six flint flakes, were found in the upper part of the silting of the ditch; but on reaching the chalk, 3 feet below the surface, there were a few large flint-nodules, and amongst these, lying on the original floor of the ditch, were twelve worked flints, mostly of rude form, but including one of the best celts found in Cissbury." These, then, must have been deposited before the ditch began to silt up; and the absence of anything Roman afforded strong presumptive evidence that the flints were of the age of the entrenchment; but, as I said at the time, it was not conclusive.

I now, in April of the present year, opened another section in the ditch (F. fig. 1, Pl. xiv.) more to the southward, 20 feet in length and 5 feet wide. This section was 200 paces to the westward of the south-west entrance to the camp. It was cut in three horizontal layers of about $1\frac{1}{2}$ foot each, and each layer was completed before the other was commenced, so that there might be no confusion between the objects found at the different levels. Brown mould was found beneath the turf for a depth of 6 to 8 inches, then hard rubble. The following were the results:—In the upper layer, two oval flint implements, one rude chipped block, a fragment of rounded tile, oyster shells, large snail shells, horses' teeth and bones, bone of a small ox, a fragment of goat's horn, and several fragments of Romano-British pottery, having grains of sand in its composition, amongst which quartz predominated, similar in texture to that found on the surface of the ground in the interior of the camp.* All this was in the upper layer of $1\frac{1}{2}$ foot. In the second and middle layer, which consisted of ferruginous chalk rubble interspersed with a number of large untouched flint-nodules, and

* This pottery was all of the same quality, $\frac{1}{4}$ -inch thick, of a dull red colour on the outside, and of a brown earthen colour in the middle. When found on the surface, it is associated with grey pottery of another description, and a few fragments of Samian ware.

was somewhat harder than the first layer, there were found four rough-chipped blocks of flint, one flint flake, sixteen oyster shells, about two hundred large snail shells, and about the same number of *Helix nemoralis*. There was no pottery found in this layer. In the third and lowest layer, which extended to the original undisturbed chalk bottom of the ditch, 5 feet beneath the silted-up surface, and which consisted of white chalk rubble with a few flint-nodules, there were found a skull and bones of pig, bones of small ox,* a number of oyster shells, a quantity of *Cyclostoma elegans*, and one small fragment of British pottery, different in texture from that found above and from that found on the surface in the interior, being smoother and thicker, about one-third of an inch thick, containing fewer and larger grains of quartz, more pasty in texture, light red on the outside and black in the middle, and resembling the pottery of some British urns found in tumuli.

This again was in favour of the pre-Roman origin of entrenchment, no metal or anything certainly Roman having been found in the ditch, and all the pottery which might be attributed to Romano-British origin having been found close to the top.

One peculiarity in the construction of the ditch deserves notice; and from its having been found in this section, and the two afterwards opened, appears to be a constant feature. The original bottom of the ditch was flat and smooth, and like the escarp and counterscarp (front and back sides of the ditch), had been cut out of the solid chalk; but in the middle of the bottom, running along the length of it, a small bank or ridge of solid chalk, about 3 feet wide and 2 feet high, had been left, which, from its resemblance to a work of that name in modern fortifications, I call a *Fausse-braye* (N. fig. 4, Pl. xv.). The use of this *Fausse-braye* it may be difficult to determine; but I suggest that as the rampart when first thrown up must have been very loose and liable to fall into the ditch, it may have been intended to catch the rubble as it fell into the ditch, and prevent its falling against the counterscarp. By this means the outer portion of the ditch may have been kept open.

Another observation worthy of record for the guidance of future explorers of rampart ditches is that the ditch, in silting up 5 feet in the course of ages, also moved about 4 feet outwards, that is to say that the present centre of the ditch is from 3 feet 6 inches to 4 feet more towards the outside than the centre of the original excavation. The reason of this is obviously on account of the greater quantity of material which has fallen into it from the large rampart in the interior than has accumulated

* Identified by Mr. Busk.

from the small rampart on the outside of the ditch. Still, however, the main object of my search—viz. to discover the mouth of a shaft in the ditch, by which to determine the relative age of the two works—had not been reached, and it was evident that in order to settle the question, excavations of much greater extent would have to be made.

As the cost of the diggings had already been considerable, and I was unwilling to undertake the expense of the additional excavation without assistance, I determined to refer the matter to the Anthropological Institute; and it may, I think, be taken as an indication that the Institute is not without vitality that I obtained a subscription of £30 from the members in a single evening. I therefore again set to work, assisted from time to time by Mr. Park Harrison, Professor Hughes, Professor Rolleston, Sir Alexander Gordon, and others. All that I have said hitherto may therefore be regarded as preliminary to the report of the exploration committee, which properly begins here.

The point now to be determined was, where to cut the next section in the ditch. In deciding this I was guided by the following considerations. The pits now ascertained to be the mouths of shafts are found in isolated places, everywhere in the interior of the entrenchment (fig. 1, Pl. xiv.), but not, as a rule, on the outside of it. They are chiefly clustered in the south-west corner, which is completely honeycombed with them down to the interior slope of the rampart. But not a single pit is to be seen on the outside, at least towards the westward, where the superficial soil over the chalk is very thin, so thin that the slightest break in the chalk would be apparent on the surface. The rampart here defines sharply the boundary of the cluster of pits on this side, and it is evident to anyone accustomed to look at ground with a view to defence that the line of the rampart has been determined by tactical considerations. It would appear, therefore, from this as if the pits must have been constructed after the rampart; indeed, this coincidence of the line of the rampart with the margin of the cluster of pits has still to be accounted for, notwithstanding the results of subsequent investigations. I had examined repeatedly the line of rampart, to see if in any case the circle of any of the pits passed under the rampart on the inside; but in no case did they appear to do so, although they came close up to it in many places. But on the south-west side a belt of thirty-nine very shallow depressions (GN. fig. 1, Pl. xiv.) might be seen running from the rampart on the outside, in a southerly direction for about 300 yards, nearly parallel to the road leading from Worthing to the south-west entrance, and about 100 yards from it. These depressions

were so shallow, not being more than a foot in depth, and differed, in this respect, and also in the small size of the diameters of some of them, so much from those in the interior of the entrenchment,* that they were not generally supposed to be the mouths of shafts, and it had been suggested by some of the explorers of Cissbury that they might perhaps be the graves of the inhabitants of the place.

I determined to examine the two nearest to the rampart of this belt of depressions, one at 30, and the other at 50, paces from the outside of the ditch (G. fig. 1, Pl. xiv.), and having dug 4 feet into both of them, I ascertained by the perpendicular chalk sides of the circular excavations found beneath the surface, that they were the mouths of shafts. In them were found several fragments of coarse red and brown pottery, unevenly coloured, and having large grains of quartz in the composition, differing, in this respect, from the surface pottery, and from that found in the upper parts of the ditch, and a piece of stag's-horn, which might perhaps have been used as a pick. This being so, and it being evident that the whole of this belt of shallow depressions were shafts, I perceived that they must, if continuous with the cluster of pits in the interior, and if made before the ditch and rampart, be found beneath the silting of the ditch, at the spot where the line of the ditch intersects the belt of shafts. It was found by measurement that the whole of the depressions on the outside averaged about 18 feet in diameter, and were at distances averaging 10, 12, and 15 yards apart from centre to centre, consequently, if they were originally continuous with the cluster in the interior, and at the same distance apart, they must be found in the space of 100 feet, now occupied by the ditch and rampart; and although, as I said before, there was no indication of them on the surface within 30 paces of the ditch, or anywhere in the ditch, all such traces of them might possibly have been obliterated by the constructors of the entrenchment.

Having thus decided upon the spot for the excavation, we re-commenced digging on the 11th June, 1875, and continued employing from five to ten men daily, with some breaks, until the end of September.

In order to avoid ambiguity, I will now abandon the order of discovery, and give the results of the excavation of each part separately, commencing with the ditch.

The excavation in the ditch was 40 feet in length and 12 feet wide, and the spot selected was situated between the last cutting and the south-west entrance, at a point where the entrenchment forms a very obtuse salient angle (H. fig. 1, Pl. xiv.). It was

* It was also noticed that no flint-chips were found on the surface near them.

cut in three horizontal layers, of from $1\frac{1}{2}$ to 2 feet each, as before (fig. 4, Pl. xiv.), with the following results. No pottery was found in the upper or lower layer, but was confined to the middle layer, at a distance of between $1\frac{1}{2}$ to 3 feet from the surface; the shells were oyster and snail shells, as before, and were found in the upper and middle layer, but not in the lowest layer. The greater part of the pottery was of a grey colour, without quartz grains, similar to some found on the surface in the interior. This pottery was remarkable for its laminar structure, peeling off into thin plates when wet, and differing from that found in the other section of the ditch, but, probably, like it, of Romano-British fabrication.* The bones were exclusively those of domesticated animals. A number of rounded sea-shore pebbles were found in all three layers, and these being of nearly uniform size, from $1\frac{1}{2}$ to 2 inches across, appear probably to have been selected, and may have been used, as sling-stones. Pebbles of this description are found in tertiary deposits, in patches, on the hill, but not in the immediate vicinity of this spot. A few rude flint tools and several chipped blocks were found in all three layers, and an occasional flint flake here and there, but the discovery of most interest in the ditch consisted of a nest of flint chips, 236 in number, and a rude chipped flint block, all of which were contained within a space of about 2 feet in diameter and 1 foot in depth (P. fig. 4, Pl. xiv.). They were in the bottom of the middle layer, and about $1\frac{1}{2}$ foot from the bottom of the ditch. These, then, must have been deposited in a mass in this spot at some time subsequent to the construction of the ditch, after it had already silted up $1\frac{1}{2}$ foot. They were situated in the ditch, about half-way between the spots where the two shafts, to be hereafter spoken of, were discovered, in a seam of the silting which formed what is geologically termed a synclinal bend, showing that the silting had fallen in from both sides, that is to say, that the ditch here had silted up gradually during long periods of time. These chips are of the character of the wasters formed by manufacturing a flint implement, and the most reasonable hypothesis that can be based upon them is that they afford evidence of the construction of a flint implement on this spot at some time subsequent to the formation of the entrenchment. A similar nest of chips, to be hereafter spoken of, in the body of the rampart serves to strengthen this opinion. The bottom of the ditch was found, as before, at 5 feet beneath the lowest part of the silted surface, and in the centre of it was again found the *Fausse-braye* already described (N. fig. 4, Pl. xiv.).

* By this term is understood pottery made by the Britons during Roman occupation, and under Roman influence.

As the excavation of the ditch proceeded from the top downwards, the solid chalk sides (escarp and counterscarp) were laid bare on both sides, and it is hardly necessary to say that in all these excavations we were careful not to cut into the undisturbed chalk, our object being to lay bare the original excavations, by digging out the rubbish of all kinds, whether formed by rain-wash, which, for the sake of clearness, will be hereafter termed "*silting*," or thrown in by the hands of the prehistoric men, which will be spoken of as "*filling*," in this paper. We found that the sides of the ditch generally stood at a slope of about 5 to 1, as before, but in one place, towards the western extremity of the cutting, we observed that the escarp was upright for the space of a few feet, and also that the rubble adjoining this upright part, and between it and the line of the slope, consisted of white chalk, in which respect it differed from the ferruginous colour of the silting of the ditch, and we at once conjectured that this white chalk was probably the *filling* of a shaft which had been cut through by the ditch-makers at the usual angle of the slope of the escarp. On reaching the bottom of the ditch our surmises were confirmed by finding the circular margin of a shaft about 9 feet in diameter (E. fig. 1, Pl. xv.), which penetrated about 4 feet into the escarp and extended across the ditch to within 2 feet of the bottom of the counterscarp on the other side. We then followed down the nearly perpendicular sides of this shaft until we reached the chalk bottom at 6 feet 6 inches beneath the bottom of the ditch (E. fig. 2, Pl. xv.). It had been filled up entirely with chalk rubble, including some blocks of considerable size, and we could find no trace of successive periods of filling, such as had been previously noticed in the shaft excavated by Mr. Willett.

The rubble of both this and the other shafts afterwards opened was of uniform density, and had evidently been filled in at one time. In the bottom of this one, on the north side, a small step of about a foot led to a gallery 25 feet in length, which ran obliquely under the main rampart in a direction nearly due north. The access to it was by a small opening 2 feet 5 inches in width by 1 foot 8 inches in height, and we observed a large flint-nodule *in situ* immediately over the top of this opening; the gallery itself, like most of those subsequently discovered, and like those of Spiennes, appeared to have been partially filled up by the people who made it. When cleared out, it was about 3 feet high from the floor, which latter was cut in one or two steps, and rose at a general angle of about 5° towards the north (fig. 2, Pl. xv.). The roof was flat and cut on the line of stratification, not arched, as it would have been if intended to be used as a habitation. The gallery opened out laterally to a width

of from 8 to 10 feet in three places (fig. 1, Pl. xv.) but without any increase of height; and these wide places communicated with each other by narrower necks 3 feet in width, so that it was evident the wider places were only cut out in the search for flints, not to be used as chambers, and the narrow necks between them were intended to support the roof, which, had it been undermined uniformly to a width of 10 feet, might probably have fallen in upon the workmen. On the west side, from 6 inches to a foot above the level of the floor, a seam of flints, nine of which were found *in situ*, ran along nearly on the same line as the floor of the gallery, that is, rising at an angle of 5° towards the north, and showing clearly the object of the gallery, and the cause of the direction that had been given to it. These flints had been broken off flush with the chalk by the prehistoric workmen, and showed a blue fracture.

I have described this first discovered gallery in detail, because the same description will apply to the majority of those opened afterwards. On the south side of the shaft, which, on account of its cutting into the escarp, was called No. 1 escarp shaft, another small step led to another gallery running southward, on the same plane of inclination, and after tracing this 11 feet, we found, by the line of the rubble rising, that we had in all probability entered another shaft (F. fig. 1, Pl. xv.). The truth of this was confirmed by digging down from the top, when we exposed a shaft slightly oval in form, having three galleries running from it, one 16 feet long, on the south; one to the north, which afterwards turned eastward and ran along the line of the counterscarp, and another communicating with two chambers, 10 and 7 feet high respectively (fig. 2, Pl. xv.); whether these chambers were originally of that height, or had been enlarged by the falling-in of the roof subsequently, we were unable to determine.

The side of one of these chambers was formed on a vein of tabular flint about an inch in thickness. Dixon, in his "Geology of Sussex," mentions the occurrence of vertical veins of tabular flint at Findon Hill, close by, and the same peculiarity is very noticeable in the chalk here; tabular seams from 1 to 2 inches thick were found to cut the shafts and galleries in many places, both vertically and in an oblique direction; but it does not appear to have been much employed by the prehistoric men. Only one piece of it was found chipped to an edge, and the quantities of it found in the rubble, sometimes pounded up into small fragments, show that it could have been but little used.

The chief interest of this shaft consisted in its being situated beneath the small outer rampart, which in this part of the camp runs along on the outside of the ditch. The stratification

showed that the shaft had been filled up to the surface with chalk rubble. In process of time the rubble, having settled down, formed a hollow similar to those now found on the surface in so many places. Into this hollow a sediment of surface clay had been deposited by rain-wash, shown by a red cup-shaped line of clay, with charcoal, 6 inches thick; and above this, the constructors of the ditch had thrown the small rampart of chalk rubble, 3 feet 6 inches in height; this formed a second point of evidence proving the greater antiquity of the shafts than the entrenchment. The lowest part of the above mentioned cup-shaped seam of clay was about 8 feet higher than the bottom of the ditch. The bottom of this shaft, which from its touching the counterscarp on its northern edge was called No. 1 counterscarp shaft, was 1 foot 7 inches lower than that of No. 1. escarp shaft, the fall coinciding with the plain depression of the seam of flints, the line of which was observed, as before, on the sides of the galleries.

At the eastern end of the excavation in the ditch, another shaft was found, and was named No. 2. escarp shaft (G. fig. 1, Pl. xv.). It cut further into the escarp than the one first described, and extended only about half-way across the ditch. As we had destroyed the evidence of the relative antiquity of the two works afforded by No. 1. escarp shaft, it was determined to preserve a section of this shaft, which might be seen by any geologists who might visit the diggings; accordingly we excavated only the half of this shaft which was nearest to the other, leaving a vertical section of the *filling* and *silting* across the middle; this section is shown in the drawing (Pl. xvi.). It will be seen that there are red seams (marked by shaded lines AA. Pl. xvi.) in the *filling* of the shaft, caused probably by portions of red clay having been thrown in whilst filling it up. These red seams, it will be observed, are unconformable with the red seam of lighter colour (BC. CD. Pl. xvi.) which marks the line of the escarp and the bottom of the ditch where it cut through the *filling* of the shaft. This latter seam was formed by *silting*, that is by rain-wash, either at the time the ditch was open, or, perhaps, subsequently by argillaceous matter percolating through the *silting* after it had been formed, until it was arrested by the harder line of the escarp and bottom. The two lines marking the escarp and bottom, it will be seen by the drawing, are in continuation of the solid chalk lines of the ditch, and they constitute a third and most conclusive proof of the priority of the shafts. We were so fortunate as to be able to keep this section open until it could be seen by Mr. Prestwich, F.R.S., who has paid such special attention to seams of gravel. He confirmed the evidence afforded by these deposits,

and pointed out to me the different constitution of the red seams (AA. Pl. xvi.) in the *filling* from those of the *silting* (BC. CD. Pl. xvi), for whilst the former consisted of nearly unaltered clay, as it is now seen upon the surface of the hill, the latter was formed by a mixture of clay and chalk in minute particles as mixed by the action of rain-water. Amongst those who visited the diggings on this occasion were Sir B. Brodie, F.R.S., Mr. Godwin Austen, F.R.S., Mr. John Evans, F.R.S., President of the Geological Society, Professor Rolleston, F.R.S., of Oxford, Mr. Busk, F.R.S., late President A.I., Mr. Auberon Herbert, Mr. Bowman, F.R.S., and Professor Smith, F.R.S., of Oxford, all of whom were satisfied with the convincing nature of the evidence afforded by this section.* At the bottom of this shaft, which was on the same level as that of No. 1 escarp, two galleries ran northward, one of which was 27 feet (the longest found), another ran about 10 feet under the ditch to the west, and on the south were three excavations of considerable width, supported by pillars left in the solid chalk; between these galleries there were two small windows about a foot square, the object of which appears to have been to probe the sides during the excavation and ascertain the distance from the adjoining gallery. A similar window was described in one of the galleries formerly opened by Mr. Willett. Over the entrance to one of these galleries, on the south of No. 2 escarp shaft, some rude scoring was found. It had been executed with a flint, and consisted of longitudinal scratches scraped with a broad edge of a flint, over which nine vertical scratches had been cut with a sharp edge. The surface of the chalk had been coated with a ferruginous oxide which had been scraped off by the flint, leaving the scratches white. Some similar scratches were seen on the side of the entrance to the west gallery. These were discovered on a Monday morning, and I myself saw a portion of them uncovered. I have no reason to doubt their genuineness, but the tools had been left in the diggings during Sunday, and the facility with which marks are made in chalk makes it necessary to receive any such facts with caution. With the exception of these scratches found in one place towards the close of our investigations, the absence of any scoring in the shafts and galleries was remarkable. I was on the look out for them from the first, but for obvious reasons avoided mentioning the subject to the workmen. A rude nondescript figure was also found, cut with a flint, on a block of chalk in the rubble of the shaft near the same place, and several fragments of chalk appeared to have been scratched by animals. The

* A letter from Mr. Prestwich on the subject is appended to this paper.

galleries from this shaft did not communicate with those of any other shaft.

Reverting now to No. 1 escarp shaft (E. fig. 1, Pl. xv.), a gallery was found running eastward under the ditch in the direction of No. 2 escarp shaft; but this, in consequence of the wet having penetrated the roof from the bottom of the ditch which had been exposed to rain, soon fell in and was abandoned. Another gallery led under the ditch to the westward. The roofs of these galleries were only 3 feet beneath the bottom of the ditch, which affords a fourth proof of the priority of the galleries. Had the ditch been open at the time, the miners would not have run galleries at so short a distance beneath the ditch.

This gallery had two branches. One to the south-west communicated by means of one of the small windows before spoken of, with other galleries afterwards opened. The other, running west, led to another opening, to which we obtained access by a narrow neck; there was also a communication by means of a window, and the opening beyond being the first found that presented this peculiarity—for it must be remembered that I have not been describing them exactly in the order of their discovery—was named the Window Chamber. Proceeding through this, we found at a distance of 18 feet from No. 1 escarp shaft that the rubble rose, indicating the presence of another shaft (H. figs. 1 and 3, Pl. xv.). The bones of animals now appeared for the first time in considerable quantities, mixed with quantities of *Helix nemoralis*. Presently a well formed and perfect lower human jaw fell down from above, and on looking up we could perceive the remainder of the skull fixed with the base downwards, and the face towards the west, between two pieces of the chalk rubble. When I saw this, I hollowed out so loudly that Mr. Harrison, who happened to be outside at the time, although he had been himself previously assisting in the excavation of this gallery, thought that it must have tumbled in, and came with a shovel to dig us out. It was some time before I could make him understand that we had added a third person to our party.

The position of the skull above the bottom of the shaft was found to be 2 feet 6 inches. The bones of the body were found afterwards in the shaft above the skull, so that the woman, for such it was, was placed with the head downwards. The skull, however, had been turned over with the crown up, which may perhaps be regarded as evidence of her having fallen into the shaft. Pl. xix. shows five views of this dolichocephalic skull, which is described by Professor Rolleston as being of unusually large size, having a cephalic index of 75, and a cubic capacity of 105 inches. A more detailed account of it will be given

by him hereafter. It was now decided to excavate this shaft from the top. Having been called away for a day by military duty, the excavation was conducted by Professor Rolleston, F.R.S., whose services we were so fortunate as to secure at this time. A cutting 6 feet wide was made across the ditch at a distance of 16 feet from the former cutting. (A section of this is shown in fig. 3, Pl. xv.). The bottom of the ditch was reached at 5 feet beneath the top of the silting as before. The shaft, now named the Skeleton Shaft (H. figs. 1 and 3, Pl. xv.), was found near the middle of the ditch, cutting through the Fausse-braye, which was seen in the sides of the section made in the ditch. This shaft was smaller than the others, being only 4 feet 6 inches in diameter, and its depth 6 feet 3 inches. The bottom, consequently, was only 7 inches lower than that of No. 1 escarp shaft. At 1 foot from the bottom, and 1 foot 6 inches beneath the skull, there was a red seam in the rubble, marking probably the line at which the shaft may have stood open for some time; and this seam penetrated into a gallery to the south. Over the shaft and on the level of the bottom of the ditch, a horizontal red seam of silting was traced through the rubble, and spreading also over the bottom of the ditch, rising over the line of the Fausse-braye, thereby constituting a fifth proof of the priority of the shaft. With the skeleton were found remains of four pigs, ox, goat, fox, and roe, which will be described in detail by Professor Rolleston.

From the skeleton shaft, a gallery 3 feet long led to another shaft on the south (K. figs. 1 and 3, Pl. xv.), about 9 feet in diameter, and named No. 2 counterscarp shaft, the bottom of which was on exactly the same level as that of the skeleton shaft. From it, four galleries led to the south, east, west, and north-west. That to the east communicated by means of a window with the galleries from No. 1 escarp shaft; that to the north-west opened into a kind of irregular square chamber, which looked into the skeleton shaft by means of a small window. All these so-called chambers, by us, were of the same height and character as the others, except that to the west, which was 8 feet high, and had, in the roof, a small hole about 3 inches high, apparently formed by hand. On excavating the rubble from this shaft, the line of the counterscarp was found, marked by a red seam of silting passing at the usual angle across the rubble in the manner already indicated in the case of the escarp in Nos. 1 and 2 escarp shafts (fig. 3, Pl. xv.). This constitutes a sixth proof of the priority of the shafts. Above this shaft was found the red cup-shaped seam formed by rain-wash over the top of the shaft after it had been filled in, as in the case already noticed in No. 1 counterscarp shaft, and

over this again was found the chalk rubble of the outer rampart, thus forming a seventh proof of the priority of the shafts.

Out of the skeleton shaft to the north, a gallery 7 feet long led to another shaft under the main rampart (L. figs. 1 and 3, Pl. xv.), termed by us, Rampart Shaft. The rubble out of this was excavated from beneath sufficiently to ascertain that it was a shaft, and a hole having been made through the rubble, the opening to another gallery 8 feet long was found leading to the north-east, which was entered and measured. This shaft being situated entirely beneath the main rampart, affords an eighth proof that the flint mines are older than the entrenchment.

The whole network of galleries thus disclosed were driven along the same vein of flints, traces of which were seen upon the sides of nearly all of them. The marks where the punches formed of the tines of deer horn (fig. 3, Pl. xviii.) had been used to extract the flints were seen in a number of places, and pieces of chalk having on them the marks of the points of these tines taken out of the galleries from positions where our own picks had not been used, were preserved for the inspection of the members. The chalk on this line of hills, forming, as all geologists are aware, the southern spring of the great anticlinal arch of the Wealden, rises here everywhere at an angle towards the north, the network of galleries following the seam of flints are all driven upon the same plane of stratification, rising at an angle of about 5 degrees towards the north. Having taken careful levels between this and Mr. Willett's and Mr. Tyndall's shafts, in the interior of the camp (K. and L. fig. 1, Pl. xiv.), and assuming Mr. Willett's shaft to have been 20 feet deep before it became partially re-filled, as is the case at present, I find that the bottom of Mr. Willett's shaft is 18·31 feet above that of the shaft E, which we excavated in the ditch. Allowing for the distance between them of 316 feet, taken obliquely in the plain of ascent, it appears quite possible that the same vein of flints may have been worked in both places. But assuming Mr. Tyndall's shaft to have been 39 feet deep, the bottom of it is 38·23 feet lower than that of Mr. Willett's, consequently, the same vein could not have been worked by these latter shafts, the distance between them being 190 feet.

In the rubble taken out of our shafts and galleries, large quantities of broken flint-nodules were found; all, however, it was noticed, being too small, or too irregular, for the construction of a good implement; and hence, probably, the reason for their having been abandoned. Like those of Spiennes, all these fractured nodules, without exception, were of the unaltered blue colour of the flint. Amongst them, however, were found in the

galleries three or four flakes (distinguishing by this term, flakes from chips), and these flakes had a white patina like those found on the surface.* This shows that the shafts were filled-in quickly by the people who made them, from materials probably taken from other pits before the fractured flints had time to become discoloured, but with them were thrown in several flakes which had lain for some time on the surface, and become whitened by exposure to the air and moisture. These particular shafts, therefore, were not the earliest of the series excavated in Cissbury.

Only one or two rude flint implements were found in the shafts. Animal remains, with the exception of those found in the skeleton shaft, were rare; fragments of deer horn were plentiful, but none which could with certainty be called picks. Broken tines (fig. 3, Pl. xviii.), which I shall afterwards show were used as punches, were common, all extremely rotten and difficult to preserve—no pottery, with the exception of one fragment of coarse red, with quartz, found in the red clay above No. 1 counterscarp shaft, and which may consequently be of a later period than the shafts. The blade-bone of a small ox was found near the bottom of No. 1 escarp shaft. The general incline of the slope of the hill showed that the shafts, at the time they were excavated and filled up, were about 17 feet deep beneath the then surface (fig. 3, Pl. xv.), and that the western group of five communicated with each other, whilst the one to the east was isolated. The small diameter of the skeleton shaft, and its proximity to No. 2 counterscarp shaft (fig. 3, Pl. xv.), has caused some doubt as to whether it could really have been a shaft extending to the surface, or only a chamber higher than the other galleries, the top of which may have been cut off in the formation of the ditch, but the ground plan shows that three galleries led from the skeleton shaft, which is in favour of its being a shaft; and it will be remembered that at Spiennes some of the shafts were of still less size, and are described as being quite close together. We must assume, therefore, that this was a shaft, and that the woman found in it, from some cause unknown, either fell in or was thrown in at some time previous to its being filled up.

We then commenced cutting a section 11 feet wide (AUVX. fig. 1, Pl. xv., and S. fig. 2, Pl. xv.) through the rampart above the cutting in the ditch, with the object of further ascertaining the age of the entrenchment, it being obvious that all objects found in the rampart must be of the same age, or earlier, than the date of its construction.

* Specimens of these flints were exhibited at the meeting.

It had already been noticed that the *Déblai* was not equal to the *Remblai*, and consequently all the earth of the rampart could not have been excavated from the ditch. This was confirmed by the section now opened, in which we recognise—1st, the surface earth thrown up from the ditch marked by a brown colour; 2nd, the chalk embankment thrown over it from the lower parts of the ditch; and 3rd, an addition to the rampart formed by successive layers of turf and rubble, of which as many as seven alternate layers were counted in one place. The original slope of the hill was marked by a red seam representing the original turf line and surface soil, before the rampart was thrown over it, and the greatest height of the rampart above this was 9 feet. Flint flakes, weathered and whitened, were found occasionally all through the rampart, also *oyster shells*, *Helix nemoralis*, *Cyclostoma elegans*, and *Helix ericetorum*. Bones of the roe and calf were found and identified by Professor Rolleston. About twenty-five fragments of pottery were found in the rampart at different levels, some, 5 feet beneath the top, in the centre, all of which was hand-made, black, or brown red, with grains of quartz, imperfectly baked and unevenly coloured, about $\frac{1}{4}$ -inch thick, corresponding to the British pottery found in tumuli, and differing both from the Romano-British pottery found in the ditch and on the surface, and from the coarser kind of pottery which had been found in the large pit in the interior. One of the most interesting relics discovered here was a flattish piece of chalk (fig. 6, Pl. xviii.) about $\frac{3}{4}$ -inch thick, and from 2 to 2 $\frac{1}{2}$ inches across, perforated by a hole half-an-inch in diameter which had been bored from both sides. Objects of this description, though common amongst prehistoric antiquities in stone, are not usual in chalk, the only other recorded instance of one made of chalk, that I am aware of, being, curiously enough, that found 18 feet deep in a shaft in Grimes Graves by Canon Greenwell.* Several rounded sea-shore pebbles, similar to those found in the ditch, were also discovered in the rampart. A nest of about forty-six flakes and chips was found within the space of a foot and a half, beneath the exterior slope of the rampart, all of which must have been deposited together at one time. This concludes the excavations in and about the rampart.

We now turn our attention to the large pit in the interior which had been already excavated to a depth of about 12 feet (M. fig. 1, Pl. xiv., and fig. 3, Pl. xiv., and figs. 1, 2, and 3, Pl. xvii.), our object being to ascertain whether the greater size of this pit, nearly 66 feet in diameter, was owing to any difference in

* "Journal of the Ethnological Society of London." New Series. Vol. ii., page 430, read June 27th, 1870.

the mode of construction. It was decided to excavate half of it in the same manner as had already been done in the case of No. 2 escarp shaft, leaving a vertical section of rubble across the middle, and, penetrating as deep as we could, to reach the bottom if possible, if not, to ascertain the form of the upper half. A scaffolding and windlass having been erected over the shaft, we sank down to a depth of 42 feet beneath the highest margin, when, wet weather coming on, and the rubble becoming rotten, a great fall in the night filled up a part of what had been excavated, and would have buried the workmen had they been there. It became evident that in order to reach the bottom it would be necessary to excavate the whole shaft, for which our funds were insufficient, and moreover, having already attained the bottoms of six shafts, it was unnecessary, and our time was better employed in clearing out the upper portions of the half-pit and throwing the rubble into the bottom, thereby filling up at the same time, which having been made one of the conditions of the landlord, Mr. Wisden, we were bound to perform.

Six distinct seams of flint (figs. 2 and 3, Pl. xvii.) were found on the sides of this pit, at from 5 to 6 feet apart. The two upper seams coincided with the floors of ledges or terraces cut in the sides of the pit (A. and C. figs. 1, 2, and 3, Pl. xvii.), the seams of flint being found in the corners of the terraces in the chalk wall just above the floor. Here and there small caves had been run in to get out more flints (B. fig. 1, Pl. xvii.). On the south-west side also, a gallery 8 feet long (D. figs. 1 and 2, Pl. xvii.) had been driven on the second terrace. These terraces were only a foot wide on the north and south sides, but the second terrace widened to 10 feet on the west side. Below that, the remaining four seams were cut through vertically, the shaft widening somewhat towards the bottom. This terrace formation had the effect of finally convincing those few neighbours who until now had still doubted that the excavations were made for flints.

The cause of this difference of form from the other shafts is easily explained. It depended on the depth beneath the surface at which the upper seam of flints was reached. We will assume that in all cases a small shaft about 9 feet wide was sunk first, when the seam was not attained until a depth of 17 to 20 feet was reached, as was the case on the south side of the series, then galleries were driven along the seams, it being too deep to excavate them by surface workings. But in the case of this large pit, situated on the north of the series on the slope of the hill, the upper seam was reached at 3 feet from the surface. It was therefore worked out by surface workings, enlarging the

shaft, and spreading out all round until the seam cropped out on the lower side of the hill, and got too deep for surface working on the upper side (see sections, figs. 2 and 3, Pl. xvii.). They then formed a terrace and went down to the next seam, which was worked out in a similar manner, the ledges left at the levels of the upper seams serving for the men to stand on and draw the rubbish up from the lower levels by means of ropes and skins, or baskets. This explains the large size of some of the pits, all of which large pits will probably be found on examination to be terraced in the same way.

In the vertical section of the rubble left standing across the centre of the pit, a red seam (EE. fig. 3, Pl. xvii.) is seen. This represents a cup-shaped deposit of harder rubble which was found all over the pit, the lowest part of which seam was about 8 feet beneath the similarly cup-shaped surface. This line probably marks the surface of a first *filling* which may have stood at this level for some little time, and been subsequently covered by another *filling*, making it 8 feet higher. The greater part of the animal remains, chipped implements, and flakes were found in this seam. Probably the fabricators worked their flints in this sheltered hollow, judging from the immense number of flint chips found in the seam, and it is important to notice that a considerable portion of the rubble overlaying this seam consisted of white chalk—*filling*, not *sitting*—obtained probably from the opening of a second shaft subsequently to that from which the first *filling* was obtained, and thrown into the hollow after it had for some time been used as a workshop, consequently all the animal remains found in this seam are of the age of the shafts, and not of any subsequent period.

The greater part of the animal remains found, appear to be those of domesticated animals, and consist of small ox, goat, and red deer, the details of which will be given hereafter by Professor Rolleston. One small jaw of goat was found 33 feet beneath the upper margin. Rude flint implements were found all through the *filling*, but chiefly in the red seam; those near the bottom were of the blue colour of the flint. Charcoal was found at a depth of 30 feet below the upper margin, and has been identified by Mr. Alfred White, F.S.A., as referable to furze, willow, and beech. The pottery in the superficial soil was of a similar character to some of that found in the ditch, but at a depth of 13 feet below the surface in the *filling* (F. fig. 3, Pl. xvii.), three pieces of a different description were found by me, in my previous diggings. This pottery was of two kinds, one red on the outside, $\frac{1}{2}$ -inch thick, mixed with large fragments of white quartz, some of which were as much as $\frac{1}{2}$ -inch in size (fig. 7, Pl. xviii.), the other a fragment of the

rim of a large vessel (fig. 8, Pl. xviii.) of dark brown pottery, hand-made, about $\frac{1}{8}$ -inch thick, mixed with smaller grains of quartz. This last, as shown by the fragment of the rim, must have been a vessel about 9 inches in diameter at the mouth, and enlarging to 13 inches at about 2 inches from it. The texture of this pottery found in the shaft shows it to be of coarser quality than any found on the surface or in the ditch in Cissbury. Another fragment of this coarser kind was now found 18 feet from the surface, and consequently some distance below the line of the red seam.

The implements of deer horn consisted of tines cut with flint round the surface, and snapped off (fig. 3, Pl. xviii.) ; also one or two wedges of deer horn cut with flint, one of which was ground all round (fig. 2; Pl. xviii.). Some of the pieces were cut with a notch all round, but not separated, and fragments of horn were found in great abundance, showing that the material must have been plentiful. They were very rotten, and none were found which could with certainty be said to have been used as picks, though several pieces were battered at the thick end as if used for hammering. A chalk cup, similar to those found by Canon Greenwell and to one found by Mr. Tyndall, was brought up from a depth of 30 feet. Also a piece of deer horn about 4 inches in length, cut with a flint on both sides, as if preparatory to the formation of a bone pin, and abandoned before completion.

In order to ascertain the exact mode of working the chalk by the prehistoric men, I made a set of deer-horn tools similar to those turned up in the diggings. Out of a pair of antlers I made two picks, one mandril, two wedges, and five tine punches. Cutting off the tines with a flint took me from five to ten minutes, and the best mode of making the wedges was found to be by grinding them on a wet sandstone. Commencing with a surface of hard, smooth chalk, and taking the work turn about with one of the men, I found that we had made an excavation 3 feet square and 3 feet deep in an hour and a half, consequently, by continuous labour, and sufficient reliefs, it would have taken us twelve hours to form the longest gallery found, viz. 27 feet. Mr. Harrison also applied one of the picks to a chalk nodule which was sticking out of the side of the chalk, and found that with it he could break it off flush with the side of the chalk, in the manner seen in the sides of the galleries. The pick, however (here at least), was not the chief tool used, but the wedge and punch, driven into the cracks in the chalk with the thick end of the horn, served to loosen the large blocks, which were then easily removed with the pick and the mandril. One of the wedges found in the rubble (fig. 5, Pl. xviii.)

showed clear evidence of having been used in this way. The edge was bruised and pierced, and a flake of the horn, about an inch square, was turned up at an angle of 45° , the interstices being filled with battered chalk, which could have been forced in only by hammering it into the chalk. When soaking this specimen in glue to preserve it, the chalk was dissolved out and the flake detached, but I have been able to glue it on again, the fractured portions fitting accurately, so as to show clearly the use to which it had been put.

In order to test the use of the blade-bone as a shovel, I obtained three blade-bones of our larger modern ox, and having cut off the spines, used them as shovels in the hand, modifying them for use in the different ways suggested by the experiment. I found that, using small chalk rubble, I could fill a wheelbarrow with it in five minutes, but with the hands I could do so in four minutes. Although this is unfavourable to the blade-bone, the saving to the hands must be considered.* On the other hand, I found that the sharp edge of the *glenoid cavity* injured the hand whilst shoving it into the rubble, and would certainly make a sore place in time, unless rounded; but neither of the two specimens of blade-bone found in the rubble were modified in this way. The edge of the *suprascapular border*, which would form the edge of the shovel, is $\frac{3}{4}$ of an inch thick in two places, and $\frac{1}{2}$ of an inch thick everywhere; this would have to be sharpened, even iron shovels require to be kept sharp, but it was untouched in both the specimens found in the rubble. The bone had probably been buried with the partially ossified *suprascapular border* attached to it, and this had decayed, leaving the margin of the ossified portion sharply defined. When fitted to a handle and properly prepared, I found it a very efficient tool, and was able to fill the wheelbarrow with it in two minutes; but as there was no evidence of this having been done by the prehistoric men, I think we must hesitate before accepting its use as a shovel by the miners here. It is true the spine was wanting in nearly all the blade-bones found, but was it cut off? or had it decayed? Some portions of bones decay more rapidly than others. The suggestion first put forward, I believe, by Mr. E. Willett is, however, ingenious, and as the bone is undoubtedly capable of being modified to the purpose, we may hope to find evidence of its having been so used hereafter, if it has not been obtained yet.

This concludes the record of our excavations up to the present time. Some points of interest have been clearly settled. The hill

* Major Godwin Austen informs me that in the eastern parts of India, with which he is familiar as an officer of the Indian Survey, the hands are used more frequently than any kind of tool by the natives in filling baskets with earth.

was used by the miners before it was occupied for defence. Some at least of the shafts and galleries, and these not the earliest, were made before the entrenchment. Was it the value of the flint mines on the hill which led to its being entrenched? Are *all* the shafts anterior to the entrenchment, or may some of them be of later date? The cause of the exact coincidence of the boundary of the pits with the curved line of the entrenchment on the west side—a line determined, as I have already said, by tactical considerations—has yet to be determined.* The mines are of the neolithic age, although some of the implements present forms connecting them with palæolithic forms. I have nothing to alter from what I said eight years ago upon this point. Does the occurrence of *Bos primigenius* and of wild animals chiefly in Mr. Tyndall's pit, and the absence of *Bos primigenius* in our more recently excavated shafts, imply an earlier date for the former, or is this difference in the fauna accidental? The entrenchment is probably of pre-Roman times, as its form indicates, and the excavations in its ditch and rampart appear to prove. That flints were still in use after its erection is probable, from the evidence adduced. There is no inherent improbability in this; the defensive works of the Mississippi valley, which most closely resemble those of our own camp period, were the works of a people who employed copper only as a malleable stone, and used obsidian for their tools and weapons. The defences of central America, of the Polynesian Islands, and of New Zealand, belong also to the age of stone. No bronze implement has been found in Cissbury, although I have formerly recorded the finding of one in the neighbouring, but differently constructed camp of Highdown. No relic of Saxon date has been discovered, and the Romans, if they occupied it, cultivated it, as shown by their vineyard terraces in the interior of the camp, which would not have been there had they used it as a fort.

It is possible that the pits which I have described in other fortified camps on the Sussex Down, and especially those of Mount Caburn, near Lewes, may hereafter turn out to be the mouths of shafts; a further examination of these is desirable.

One clear line of conchological evidence has been drawn. Oysters, common in the rampart and in the ditch down to the very bottom, were, from causes very different, almost as little known to the miners as to ourselves, not one having been found in the *filling* of the shafts and galleries. I leave it to conchologists to decide upon the value of this point of evidence. The pottery of the different periods, represented upon the hill,

* See also my remarks on the tactical outline of this and similar British camps, in the "Archæologia," vol. xlii., pp. 45 and 48.

has been determined; and last, though not least amongst the achievements of an heroic age, a committee of the Anthropological Institute has done some work. The funds liberally subscribed by the members have not been exceeded.

Whilst the framing of this report has naturally fallen to my lot, I must not fail to remind the members that we are greatly indebted to my colleague, Mr. Park Harrison, for the assistance that he has afforded me during a great part of the explorations. To his pencil is due the sketch of the section in No. 2. escarp shaft which accompanies this paper; to his careful superintendence of the workmen, to the facility with which he crept into sundry places which my dimensions did not enable me to penetrate with the same ease, and to his active co-operation with me throughout, the Institute is indebted for no small portion of the information contained in this report. To Professor Rolleston, for his advice and assistance; to Mr. Ballard, of Broadwater, for facilitating our excavations in many ways, and more especially for lending us our two best workmen, Guiles and Wady; to Mr. Tupper, the gamekeeper, for a helping hand on several occasions; and to Mr. Wisden, the owner of the property, for his hospitality, and the uniform kindness with which he has promoted our explorations, the committee are also greatly indebted. Several non-members of the Institute have joined us in our investigations; and the results of this our first attempt in the field of original research, will, I trust, encourage the Institute to continue similar explorations in years to come. I propose, on a future occasion, to offer to the Institute some remarks on the forms of the implements found in Cissbury at different times.

Models of the large pit and of the entrenchment, with the shafts and galleries beneath, made accurately to scale by Colonel Lane Fox, were exhibited at the meeting, and are now in his anthropological collection at Bethnal Green, together with the experimental tools employed to ascertain the mode of working the galleries. The plans and sections accompanying this paper are also drawn accurately to scale. Plates xv. and xvii. being on the same scale, enables a comparison to be made of the size of the two works.

The following are the animal remains found in the two pits, as determined by Professor ROLLESTON, F.R.S. :—

Ancient Remains in Large Pit.—Goat, *Capra hircus*; Horn cores; Roe, *Cervus capriolus*; Pig, *Sus scrofa* var. *domesticus*; Ox, *Bos longifrons*; Red Deer, *Cervus elaphus*; Horse, *Equus caballus*, teeth from superficial layers only.

Ancient Remains in Skeleton Pit.—Goat, *Capra hircus*; Roe,

Cervus capriolus; Fox, *Canis vulpes*; Pig, *Sus scrofa* var. *domesticus*. Four pigs of various ages, two very young, one only old, were represented in this pit; there were not by any means a large number of bones of this species. Shrew mice, voles, and toads were also represented by the bones found in this pit. Six species of snails were found in the Skeleton Pit, viz:—*Helix nemoralis* (numerous), *Helix lapicida*, *Helix rotundata*, *Helix arbustorum*, *Zonites cellaria*, *Cyclostoma elegans* (very numerous). Woman—*Homo sapiens*.—The skeleton, nearly entire, of a woman with a cephalic index of .75, and skull of a cubic capacity of 105 cubic inches.

There were no remains of *Bos primigenius* or wild boar in any of the shafts or galleries examined.

The following letter from Professor PRESTWICH was received by the President:—

"I told you on the spot what I thought of the interesting works over which you so kindly conducted us on Thursday last, and I have jotted down on paper the few conclusions which, after full consideration of the geological conditions, I am enabled to form, though I fear it is a very small geological contribution.

"1. The fact of some of the shafts opening under the rampart clearly shows the distinct and relative age of the two works—that the underground galleries and the shafts are older than the camp. 2. The *débris* with which the shafts were filled had evidently been freshly removed, and at once used at the time of filling, as the blocks of chalk, had they been exposed to the air for even one winter would have crumbled and fallen to pieces, and the small quantity of stiff red clay would have lost its pure colour and tenacious character.* 3. There seems to have been a little, but not much, weathering of the sides of the shafts before the filling up took place. 4. The filling in the bottom of the ditch is due to weathering and rain-wash.

"While the shape of most of the flint implements is clearly neolithic, there are some which certainly approach very closely to palæolithic implements; but the use of horn, and the absence of all animal remains, except those of domestic animals and of wild boar and *Bos primigenius* sufficiently fix the former date.† It is, however, very interesting to find the old type still existing at that period, although apparently in process of

* This remark of Mr. Prestwich's is fully confirmed by the rubble excavated from Mr. Willett's shaft, which having remained exposed on the surface for one year, has been weathered into a solid mass.—A. L. F.

† These animals, it will be remembered, were found in Mr. Tyndall's shaft, but not in any of the others.—A. L. F.

being superseded by the newer ones. It, in my opinion, carries back the age of the diggings to a period considerably anterior to that of the camp."

The President also communicated the following note by Mr. GODWIN AUSTEN, F.R.S., who visited the excavations with the party of distinguished scientists alluded to in the paper:—

"Cissbury Camp, Worthing, is an irregular earthwork, consisting of an outer bank, deep ditch, and a lofty inner bank. The interest attaching to the recent explorations at this place is the evidence brought out of successive change. Evidence of early occupation is indicated by a double row of equidistant, circular depressions along the hill-side, which run towards the camp, and are continued within its area. The recent excavations were made on the line of these depressions, and just where it crossed the earthworks. It may be mentioned that the surface at this place offered no indication of circular depressions, and the spot fixed upon was taken from its position with reference to the depressions outside. The excavation showed circular shafts or pits, several feet in depth, and which at bottom threw off low horizontal galleries. It was also ascertained that the circular depressions were connected with vertical pits and chambers.

"The close attention with which the exploration was pursued, and the use made of every scrap of evidence as it came out, entitle Col. Lane Fox and Mr. Harrison to great credit. In this way it became clear that the earthworks of the camp were thrown up subsequently to the formation of the lines of circular shafts and chambers and their resulting circular depressions. It also appeared to me as if the lower or outer bank was the first that was thrown up, and which is just such in its dimensions as are many of the single rings which occur in so many places over the chalk downs of the south-east of England, none of which can be considered as defensive works, unless they supported a palisade. The inner embankment conforms to the outer, and, from its magnitude, is an imposing work. A cross section of this, made by the explorers, seemed to suggest that, in its ultimate form, it was the result of two successive additions to its height.

"In form the Cissbury camp is not truly circular, as are so many of the earthworks of the early British people; but the object to be attained in this was to make the encampment include the series of vertical shafts, as important to the inmates of the camp. The purpose for which such excavations were made can be the subject of conjecture only; as yet they have not afforded any clue to this. The flint implements which have

been found in and about the area of Cissbury indicate that it is referable to an early British period. Considering the nature of the implements at the service of such a people, such shafts and galleries must have been great and laborious undertakings, having corresponding advantages, as connected with their means of living, such as winter underground retreats for themselves, after the manner of the cave people, for which the small galleries would be well suited, or else as storing-places for grain and provender, as was done underground by the Rhemi of Gaul, whence the early inhabitants of this part of England came. One thing is clear, that, whatever the original intention of these excavations may have been, there came a time when they were no longer needed, but were disused and finally filled in."

EXPLANATION OF PLATES XIV. TO XIX.

Plate XIV.

From Survey by Col. A. Lane Fox.

Fig. 1.—Plan of Cissbury Camp.

Fig. 2.—Section on line *CD*, across rampart.

Fig. 3.—Section on line *AB*, through large pit and rampart.

Plate XV.

From Survey by Col. A. Lane Fox.

Fig. 1.—Plan of galleries and shafts beneath ditch and rampart at Cissbury.

Fig. 2.—Section on line *AB*, through No. 1 escarp shaft.

Fig. 3.—Section on line *CD*, through skeleton shaft.

Fig. 4.—Section of ditch, showing layers of cutting and position of pottery and flakes.

Plate XVI.

Section through escarp pit No. 2 and ditch of Camp at Cissbury. From sketch by Mr. J. Park Harrison.

Plate XVII.

From Survey by Col. A. Lane Fox.

Fig. 1.—Plan of large pit at Cissbury.

Fig. 2.—Section on line *RT*, with south-west view.

Fig. 3.—Section on line *RT*, with north-east view.

Plate XVIII.

Fig. 1.—Mallet of deer horn, used for driving in the tin punches (fig. 3) and the wedges (fig. 2), showing marks of bruising, found in large pit; half-size.

Fig. 2.—Wedge of deer horn ground to an edge, found in large pit; half-size.

Fig. 3.—Punch formed of the tine of a deer horn, cut off with a flint at top, found in large pit; half-size.

Fig. 4.—Tine of deer horn, cut off at top with a flint, found in large pit; half-size.

Fig. 5.—Wedge of deer horn, cut with a flint at side, and showing marks of wear at the point, found in large pit; half-size.

Fig. 6.—Fragment of chalk, perforated by a hole bored from both sides, found in section of rampart; half-size.

Fig. 7.—Fragment of coarse pottery found in the silting of the large pit, beneath red seam; full size.

Fig. 8.—Fragment of brown pottery found in silting of large pit, beneath red seam; full size.

Plate XIX.

Skull of female found with other remains in the skeleton shaft at Cissbury. From drawing furnished by Professor Rolleston, F.R.S.

Fig. 1.—Norma lateralis.

Fig. 2.—Norma verticalis.

Fig. 3.—Norma basalis.

Fig. 4.—Norma occipitalis.

Fig. 5.—Norma facialis.

DISCUSSION.

Mr. ERNEST WILLETT said: After the exhaustive manner in which your President has this evening both reviewed the past history of Cissbury, and given an account of the recent carefully prosecuted excavations, little remains to be said. But as one who has taken a great deal of interest, and given much thought to the Camp, I am glad to be here to-night to endorse fully his arguments as to the relative priority of the pits to the vallum. I stated, in conclusion of my paper on the subject read before the Society of Antiquaries in April, that this was a point it was most desirable to settle, and that it would require a considerable amount of time and work to do it. As this has been now done by the liberality of the Institute, and I think the facts demonstrated by the President, who so kindly undertook the superintendence of the work, beyond all reasonable doubt, it leaves little more, as far as our present inquiry extends, to be settled as to Cissbury.

Lord ROSEHILL believed he was in possession of several implements and other remains—found either in the pits he worked himself, or in the one worked by the late Mr. Tyndall—which were as yet undescribed, and unrepresented in the collection before the meeting. He would be glad to produce these specimens at some future meeting, if thought desirable, and at the same time add in any way in his power to the facts or information already produced by others in connection with this very interesting discovery.

Professor BOYD DAWKINS said that he had examined and made a list of the bones and teeth from the pit excavated in 1874 by Mr. Tyndall, which were shown him by that gentleman at Brighton, and he has a distinct recollection that among them there were domestic animals such as the goat.* This pit, therefore, merely differed from those described by Colonel Lane Fox in presenting two wild animals not found in the former.

Mr. PARK HARRISON, Mr. FRANKS, and Professor ROLLESTON offered some remarks.

The author briefly replied.

A series of diagrams, two models, and a large collection of flint implements and animal remains, were exhibited in illustration of the paper. The meeting then separated.

* Note.—December 10, 1875.—List of species: urus (*Bos primigenius*), roe, stag, wild boar, badger, *Bos longifrons*, goat, dog. The above wild and domestic animals were in Mr. Tyndall's possession in August, 1874.

Fig. 2.



CISSBURY SECTION ON LINE C.D.

E. SECTION OF DITCH OPENED IN 1867
 F. DITCH OPENED IN APRIL 1875
 G. N. LINE OF PITS OUTSIDE RAMPART
 H. TWO PITS OPENED
 I. SECTION OF DITCH OPENED JUNE 1875
 K. N. WILLETTS' PIT

L. N. TYNALL'S PIT
 M. LARGE PIT
 N. ROMAN POTTERY FOUND ON SURFACE
 O. TERRACE, PROBABLY FORMED BY CULTIVATION

Fig. 1.

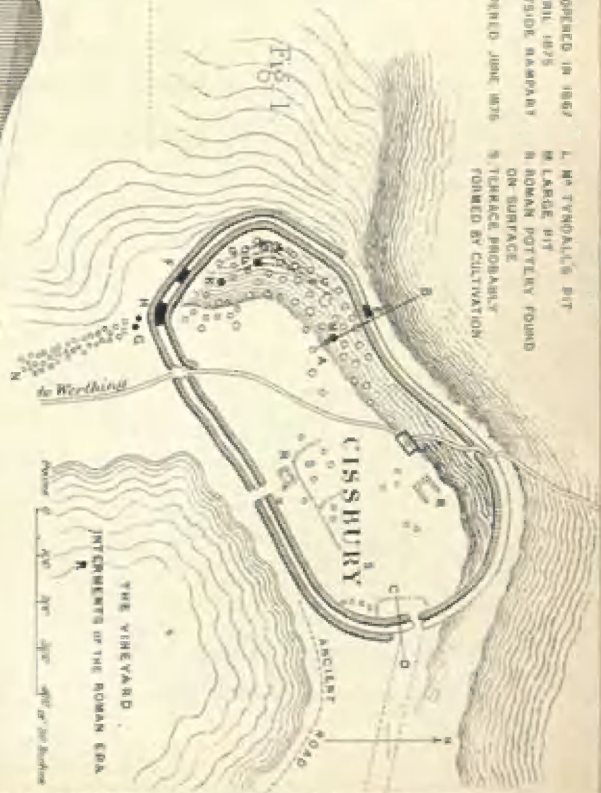


Fig. 3.

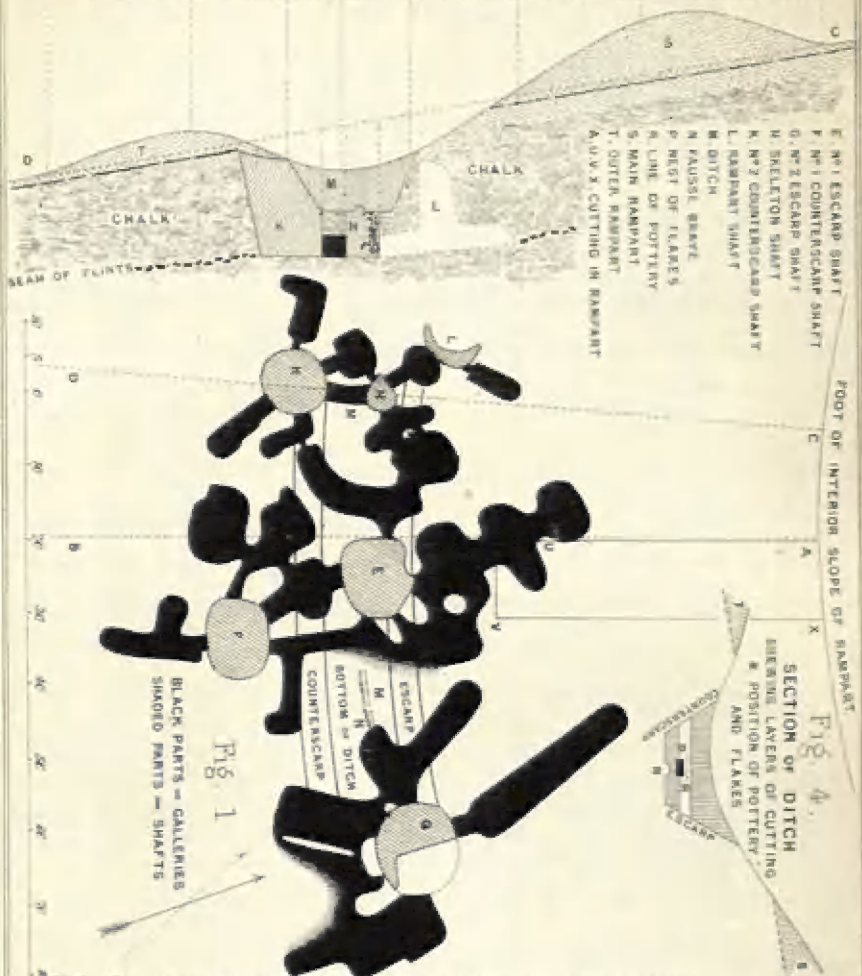
CISSBURY SECTION ON LINE A.B. THROUGH LARGE PIT AND RAMPART



1 INCH = 10 FEET



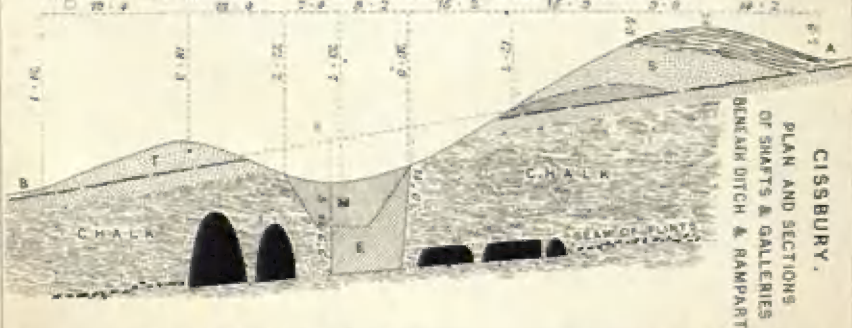
Fig. 3 SECTION ON THE LINE C.D. THROUGH SKELETON SHAFT.



BLACK PARTS = GALLERIES
SHADED PARTS = SHAFTS

Fig. 1

Fig. 2 SECTION ON THE LINE A.B. THROUGH NO. 1 ESCARP SHAFT



CISSBURY.
PLAN AND SECTIONS
OF SHAFTS & GALLERIES
BENEATH DITCH & RAMPART.



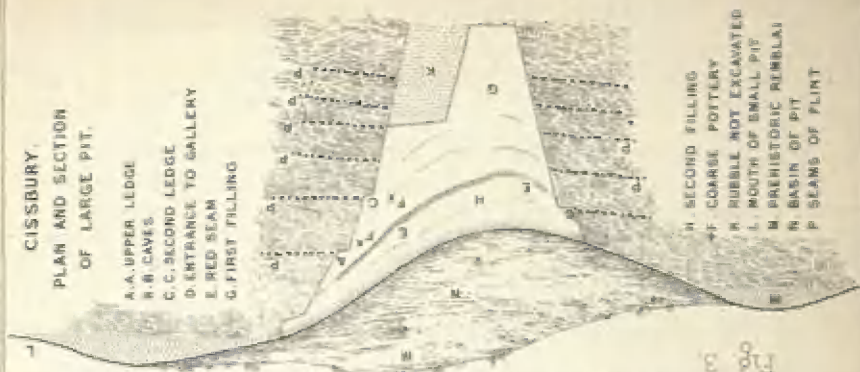


CISSBURY.

PLAN AND SECTION
OF LARGE PIT.

- A.A. UPPER LEDGE
- B.B. CAVES
- C.C. SECOND LEDGE
- D. ENTRANCE TO GALLERY
- E. RED SEAM
- G. FIRST FILLING

- H. SECOND FILLING
- I. COARSE POTTERY
- K. RUBBLE NOT EXCAVATED
- L. MOUTH OF SMALL PIT
- M. PREHISTORIC REMNANT
- N. BASIN OF PIT
- P. SLAMS OF FLINT



SECTION ON THE LINE A.T. WITH NORTH EAST VIEW.

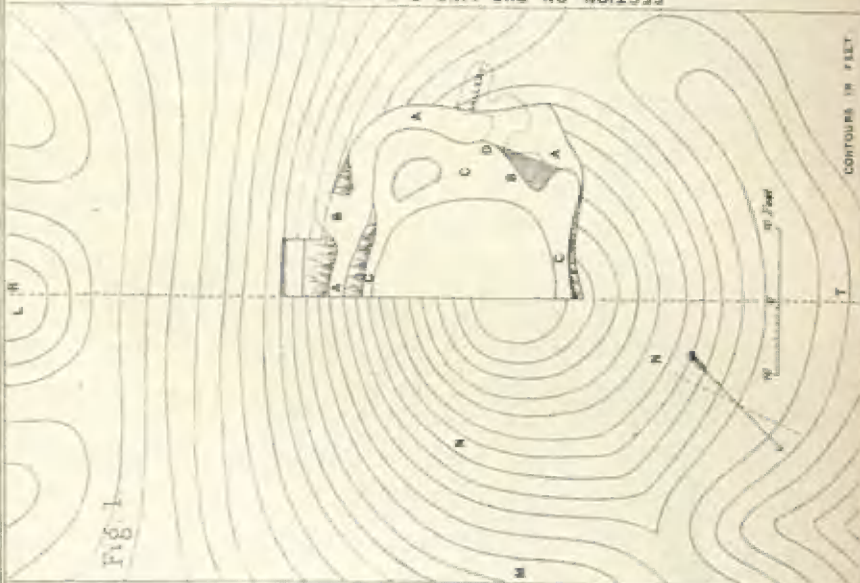


Fig. 2 SECTION ON THE LINE R.T. WITH SOUTH WEST VIEW.

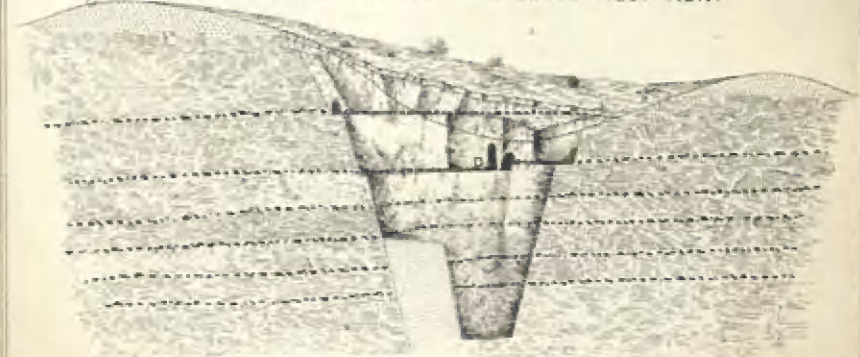


Fig. 1



Fig. 2



Fig. 3



Fig. 5



Fig. 4



Fig. 8

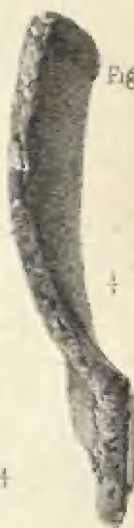


Fig. 6



Fig. 7



C. J. Bell, London, E. C.

IMPLEMENTS OF STAGS HORN. PIECE OF PERFORATED CHALK AND POTTERY FROM CISSBURY.



Fig. 2.



Fig. 3.

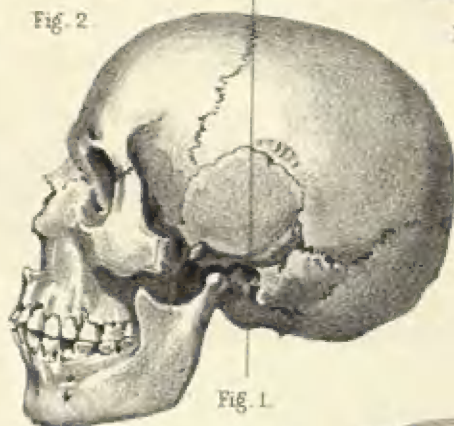


Fig. 1.

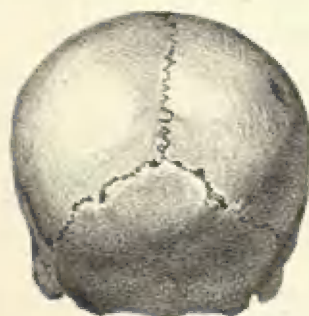


Fig. 4.



Fig. 5.

U. P. Hall, Libr. Castle St. Bolton, E. C.

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ANTHROPOLOGICAL MISCELLANEA.

The HISTORY of TWINS, as a Criterion of the RELATIVE POWERS of NATURE and NURTURE. By FRANCIS GALTON, F.R.S.*

THE exceedingly close resemblance attributed to twins has been the subject of many novels and plays, and most persons have felt a desire to know upon what basis of truth those works of fiction may rest. But twins have many other claims to attention, one of which will be discussed in the present memoir. It is, that their history affords means of distinguishing between the effects of tendencies received at birth, and of those that were imposed by the circumstances of their after lives; in other words, between the effects of nature and of nurture.† This is a subject of especial importance in its bearings on investigations into mental heredity, and I, for my part, have keenly felt the difficulty of drawing the necessary distinction whenever I tried to estimate the degree in which mental ability was, on the average, inherited. The objection to statistical evidence in proof of its inheritance has always been: "The persons whom you compare may have lived under similar social conditions and have had similar advantages of education, but such prominent conditions are only a small part of those that determine the future of each man's life. It is to trifling accidental circumstances that the bent of his disposition and his success are mainly due, and these you leave wholly out of account—in fact, they do not admit of being tabulated, and therefore your statistics, however plausible at first sight, are really of very little use." No method of inquiry which I have been able to carry out—and I have tried many methods—is wholly free from this objection. I have therefore attacked the problem from the opposite side, seeking for some new method by which it would be possible to weigh in just scales the respective effects of nature and nurture, and to ascertain their several shares in framing the disposition and intellectual ability of men. The life history of twins supplies what I wanted. We might begin by inquiring about twins who were closely alike in boyhood and

* Reprinted, with revision and additions, from *Fraser's Magazine*, Nov. 1875.

† In my "English Men of Science," 1874, p. 12, I treated this subject in a cursory way. It subsequently occurred to me that it deserved a more elaborate inquiry, which I made, and of which this paper is a result.

youth, and who were educated together for many years, and learn whether they subsequently grew unlike, and, if so, what the main causes were which, in the opinion of the family, produced the dissimilarity. In this way we may obtain direct evidence of the kind we want. Again, we may obtain yet more valuable evidence by a converse method. We might inquire into the history of twins who were exceedingly unlike in childhood, and learn how far their characters became assimilated under the influence of identical natures, inasmuch as they had the same home, the same teachers, the same associates, and in every other respect the same surroundings.

My materials were obtained by sending circulars of inquiry to persons who were either twins themselves or the near relations of twins. The printed questions were in thirteen groups; the last of them asked for the addresses of other twins known to the recipient, who might be likely to respond if I wrote to them. This happily led to a continually widening circle of correspondence, which I pursued until enough material was accumulated for a general reconnaissance of the subject.

There is a large literature relating to twins in their purely surgical and physiological aspect. The reader interested in this should consult *Die Lehre von den Zwillingen*, von L. Kleinwächter, Prag. 1871. It is full of references, but it is also unhappily disfigured by a number of numerical misprints, especially in page 26. I have not found any book that treats of twins from my present point of view.

The reader will easily understand that the word "twins" is a vague expression, which covers two very dissimilar events—the one corresponding to the progeny of animals that have usually more than one young one at a birth, each of which is derived from a separate ovum, while the other is due to the development of two germinal spots in the same ovum. In the latter case, they are enveloped in the same membrane, and all such twins are found invariably to be of the same sex. The consequence of this is, that I find a curious discontinuity in my results. One would have expected that twins would commonly be found to possess a certain average likeness to one another; that a few would greatly exceed that degree of likeness, and a few would greatly fall short of it. But this is not at all the case. Extreme similarity and extreme dissimilarity between twins of the same sex, are nearly as common as moderate resemblance. When the twins are a boy and a girl, they are never closely alike; in fact, their origin is never due to the development of two germinal spots in the same ovum.

I have received about eighty returns of cases of close similarity, thirty-five of which entered into many instructive

details. In a few of these not a single point of difference could be specified. In the remainder, the colour of the hair and eyes were almost always identical; the height, weight, and strength were generally nearly so. Nevertheless, I have a few cases of a notable difference in these, although the resemblance was otherwise very near. The manner and address of the thirty-five pairs of twins is usually described as very similar, though there often exists a difference of expression, familiar to near relatives, but unperceived by strangers. The intonation of the voice when speaking is commonly the same, but it frequently happens that the twins sing in different keys. Most singularly the one point in which similarity is rare, is the handwriting. I can with difficulty account for this, considering how strongly handwriting runs in families, but I am sure of the fact. I have only one case in which nobody, not even the twins themselves, could distinguish their own notes of lectures, &c.; barely two or three in which the handwriting was undistinguishable by others, and only a few in which it was described as closely alike. On the other hand, I have many in which it is stated to be unlike, and some in which it is alluded to as the only point of difference. It would appear that the handwriting is a very delicate test of difference in organisation—a conclusion which I commend to the notice of enthusiasts in the art of discovering character by the handwriting.

One of my inquiries was for anecdotes as regards the mistakes made by near relatives, between the twins. The replies are numerous, but not very varied in character. When the twins are children, they have commonly to be distinguished by ribbons tied round their wrist or neck; nevertheless the one is sometimes fed, physicked, and whipped by mistake for the other, and the description of these little domestic catastrophes is usually given to me by the mother, in a phraseology that is somewhat touching by reason of its seriousness. I have one case in which a doubt remains whether the children were not changed in their bath, and the presumed A is not really B, and *vice versâ*. In another case, an artist was engaged on the portraits of twins who were between three and four years of age; he had to lay aside his work for three weeks, and, on resuming it, could not tell to which child the respective likenesses he had in hand belonged. The mistakes are less numerous on the part of the mother during the boyhood and girlhood of the twins, but almost as frequent on the part of strangers. I have many instances of tutors being unable to distinguish their twin pupils. Two girls used regularly to impose on their music teacher when one of them wanted a whole holiday; they had their lessons at separate hours, and the one girl sacrificed herself to receive two

lessons on the same day, while the other one enjoyed herself. Here is a brief and comprehensive account:—"Exactly alike in all, their schoolmasters never could tell them apart; at dancing parties they constantly changed partners without discovery; their close resemblance is scarcely diminished by age." The following is a typical schoolboy anecdote:—"Two twins were fond of playing tricks, and complaints were frequently made; but the boys would never own which was the guilty one, and the complainants were never certain which of the two he was. One head master used to say he would never flog the innocent for the guilty, and another used to flog both." No less than nine anecdotes have reached me of a twin seeing his or her reflection in a looking-glass, and addressing it, in the belief it was the other twin in person. I have many anecdotes of mistakes when the twins were nearly grown up. Thus:—"Amusing scenes occurred at college when one twin came to visit the other; the porter on one occasion refusing to let the visitor out of the college gates, for, though they stood side by side, he professed ignorance as to which he ought to allow to depart."

Children are usually quick in distinguishing between their parent and his or her twin; but I have two cases to the contrary. Thus, the daughter of a twin says:—"Such was the marvellous similarity of their features, voice, manner, &c., that I remember, as a child, being very much puzzled, and I think, had my aunt lived much with us, I should have ended by thinking I had two mothers." In the other case, a father who was a twin, remarks of himself and his brother:—"We were extremely alike, and are so at this moment, so much so that our children up to five and six years old did not know us apart."

I have four or five instances of doubt during an engagement of marriage. Thus:—"A married first, but both twins met the lady together for the first time, and fell in love with her there and then. A managed to see her home and to gain her affection, though B went sometimes courting in his place, and neither the lady nor her parents could tell which was which." I have also a German letter, written in quaint terms, about twin brothers who married sisters, but could not easily be distinguished by them.* In the well-known novel by Mr. Wilkie Collins of "Poor Miss Finch," the blind girl distinguishes the twin

* I take this opportunity of withdrawing an anecdote, happily of no great importance, published in "*Men of Science*," p. 14, about a man personating his twin brother for a joke at supper, and not being discovered by his wife. It was told me on good authority; but I have reason to doubt the fact, as the story is not known to the son of one of the twins. However, the twins in questions were extraordinarily alike, and I have many anecdotes about them sent me by the latter gentleman.

she loves by the touch of his hand, which gives her a thrill that the touch of the other brother does not. Philosophers have not, I believe, as yet investigated the conditions of such thrills; but I have a case in which Miss Finch's test would have failed. Two persons, both friends of a certain twin lady, told me that she had frequently remarked to them that "kissing her twin sister was not like kissing her other sisters, but like kissing herself—her own hand for example."

It would be an interesting experiment for twins who were closely alike, to try how far dogs could distinguish between them by scent.

I have a few anecdotes of strange mistakes made between twins in adult life. Thus, an officer writes:—"On one occasion when I returned from foreign service my father turned to me and said, 'I thought you were in London,' thinking I was my brother—yet he had not seen me for nearly four years—our resemblance was so great."

The next and last anecdote I shall give is, perhaps, the most remarkable of those I have; it was sent me by the brother of the twins, who were in middle life at the time of its occurrence: "A was again coming home from India, on leave; the ship did not arrive for some days after it was due; the twin brother B had come up from his quarters to receive A, and their old mother was very nervous. One morning A rushed in, saying, 'Oh, mother, how are you?' Her answer was, 'No, B, it's a bad joke; you know how anxious I am!' and it was a little time before A could persuade her that he was the real man."

Enough has been said to prove that an extremely close personal resemblance frequently exists between twins of the same sex; and that, although the resemblance usually diminishes as they grow into manhood and womanhood, some cases occur in which the resemblance is lessened in a hardly perceptible degree. It must be borne in mind that the divergence of development, when it occurs, need not be ascribed to the effect of different natures, but it is quite possible that it may be due to the appearance of qualities inherited at birth, though dormant, like gout, in early life. To this I shall recur.

There is a curious feature in the character of the resemblance between twins, which has been alluded to by a few correspondents; it is well illustrated by the following quotations. A mother of twins says:—"There seemed to be a sort of interchangeable likeness in expression, that often gave to each the effect of being more like his brother than himself." Again, two twin brothers, writing to me, after analysing their points of resemblance, which are close and numerous, and pointing out certain shades of difference, add—"These seem to have marked

us through life, though for a while, when we were first separated, the one to go to business, and the other to college, our respective characters were inverted; we both think that at that time we each ran into the character of the other. The proof of this consists in our own recollections, in our correspondence by letter, and in the views which we then took of matters in which we were interested." In explanation of this apparent interchangeableness, we must recollect that no character is simple, and that in twins who strongly resemble each other, every expression in the one may be matched by a corresponding expression in the other, but it does not follow that the same expression should be the dominant one in both cases. Now it is by their dominant expressions that we should distinguish between the twins; consequently when one twin has temporarily the expression which is the dominant one in his brother, he is apt to be mistaken for him. There are also cases where the development of the two twins is not strictly *pari passu*; they reach the same goal at the same time, but not by identical stages. Thus:—A is born the larger, then B overtakes and surpasses A, and is in his turn overtaken by A, the end being that the twins become closely alike. This process would aid in giving an interchangeable likeness at certain periods of their growth, and is undoubtedly due to nature more frequently than to nurture.

Among my thirty-five detailed cases of close similarity, there are no less than seven in which both twins suffered from some special ailment or had some exceptional peculiarity. One twin writes that she and her sister "have both the defect of not being able to come downstairs quickly, which, however, was not born with them, but came on at the age of twenty." Three pairs of twins have peculiarities in their fingers; in one case it consists in a slight congenital flexure of one of the joints of the little finger; it was inherited from a grandmother, but neither parents, nor brothers, nor sisters show the least trace of it. In another case the twins have a peculiar way of bending the fingers, and there was a faint tendency to the same peculiarity in the mother, but in her alone of all the family. In a third case, about which I made a few inquiries, which is given by Mr. Darwin, but is not included in my returns, there was no known family tendency to the peculiarity in the twins of a crooked little finger. In another pair of twins, one was born ruptured, and the other became so at six months old. Two twins at the age of twenty-three were attacked by toothache, and the same tooth had to be extracted in each case. There are curious and close correspondences mentioned in the falling off of the hair. Two cases are mentioned of death from the same

disease; one of which is very affecting. The outline of the story was that the twins were closely alike and singularly attached, and had identical tastes; they both obtained Government clerkships, and kept house together, when one sickened and died of Bright's disease, and the other also sickened of the same disease and died seven months later.

In no less than nine out of the thirty-five cases does it appear that both twins are apt to sicken at the same time. This implies so intimate a constitutional resemblance, that it is proper to give some quotations in evidence. Either the illnesses were non-contagious in the instances to which I refer, or if contagious, they caught them simultaneously; they did not catch them the one from the other. Thus, the father of two twins says: "Their general health is closely alike; whenever one of them has an illness, the other invariably has the same within a day or two, and they usually recover in the same order. Such has been the case with whooping-cough, chicken-pox, and measles; also with slight bilious attacks, which they have successively. Latterly, they had a feverish attack at the same time." Another parent of twins says:—"If anything ails one of them, identical symptoms *nearly always* appear in the other; this has been singularly visible in two instances during the last two months. Thus, when in London, one fell ill with a violent attack of dysentery, and within twenty-four hours the other had precisely the same symptoms." A medical man writes of twins with whom he is well acquainted:—"Whilst I knew them, for a period of two years, there was not the slightest tendency towards a difference in body or mind; external influences seemed powerless to produce any dissimilarity." The mother of two other twins, after describing how they were ill simultaneously up to the age of fifteen, adds, that they shed their first milk teeth within a few hours of each other.

Trousseau has a very remarkable case (in the chapter on Asthma) in his important work "*Clinique Médicale*." (In the edition of 1873, it is in vol. ii. p. 473.) It was quoted at length in the original French, in Mr. Darwin's "*Variation under Domestication*," vol. ii. p. 252. The following is a translation:—

"I attended twin brothers so extraordinarily alike, that it was impossible for me to tell which was which, without seeing them side by side. But their physical likeness extended still deeper, for they had, so to speak, a yet more remarkable pathological resemblance. Thus, one of them, whom I saw at the Néothermes at Paris, suffering from rheumatic ophthalmia, said to me, 'At this instant my brother must be having an ophthalmia like mine;' and, as I had exclaimed against such an assertion, he showed me a few days afterwards a letter just

received by him from his brother, who was at that time at Vienna, and who expressed himself in these words—'I have my ophthalmia; you must be having yours.' However singular this story may appear, the fact is none the less exact; it has not been told to me by others, but I have seen it myself; and I have seen other analogous cases in my practice. These twins were also asthmatic, and asthmatic to a frightful degree. Though born in Marseilles, they were never able to stay in that town, where their business affairs required them to go, without having an attack. Still more strange, it was sufficient for them to get away only as far as Toulon in order to be cured of the attack caught at Marseilles. They travelled continually, and in all countries, on business affairs, and they remarked that certain localities were extremely hurtful to them, and that in others they were free from all asthmatic symptoms."

I do not like to pass over here a most dramatic tale in the "*Psychologie Morbide*" of Dr. J. Moreau (de Tours), Médecin de l'Hospice de Bicêtre. Paris, 1859, p. 172. He speaks "of two twin brothers who had been confined, on account of monomania, at Bicêtre. . . . Physically the two young men are so nearly alike that the one is easily mistaken for the other. Morally, their resemblance is no less complete, and is most remarkable in its details. Thus, their dominant ideas are absolutely the same. They both consider themselves subject to imaginary persecutions; the same enemies have sworn their destruction, and employ the same means to effect it. Both have hallucinations of hearing. They are both of them melancholy and morose; they never address a word to anybody, and will hardly answer the questions that others address to them. They always keep apart, and never communicate with one another. An extremely curious fact which has been frequently noted by the superintendents of their section of the hospital, and by myself, is this: From time to time, at very irregular intervals of two, three, and many months, without appreciable cause, and by the purely spontaneous effect of their illness, a very marked change takes place in the condition of the two brothers. Both of them, at the same time, and often on the same day, rouse themselves from their habitual stupor and prostration; they make the same complaints, and they come of their own accord to the physician, with an urgent request to be liberated. I have seen this strange thing occur, even when they were some miles apart, the one being at Bicêtre, and the other living at Saint-Anne." Dr. Moreau ranked as a very considerable medical authority, but I cannot wholly accept this strange story without fuller information. Dr. Moreau writes it in too off-hand a way to carry the conviction that he had investigated the circumstances

with the sceptic spirit and scrupulous exactness which so strange a phenomenon would have required. If full and precise notes of the case exist, they certainly ought to be published at length. I sent a copy of this passage to the principal authorities among the physicians to the insane in England, asking if they had ever witnessed any similar case. In reply, I have received three noteworthy instances, but none to be compared in their exact parallelism with that just given. The details of these three cases are painful, and it is not necessary to my general purpose that I should further allude to them.

There is another curious French case of insanity in twins, which was pointed out to me by Professor Paget, described by Dr. Baume in the "*Annales Médico-Psychologiques*," 4 série, vol. i. 1863, p. 312, of which the following is an abstract. The original contains a few more details, but is too long to quote: François and Martin, fifty years of age, worked as railroad contractors between Quimper and Châteaulin. Martin had twice had slight attacks of insanity. On January 15 a box in which the twins deposited their savings was robbed. On the night of January 23-4 both François (who lodged at Quimper) and Martin (who lived with his wife and children at St. Lorette, two leagues from Quimper) had the same dream at the same hour, three a.m., and both awoke with a violent start, calling out, "I have caught the thief! I have caught the thief! they are doing mischief to my brother!" They were both of them extremely agitated, and gave way to similar extravagances, dancing and leaping. Martin sprang on his grandchild, declaring that he was the thief, and would have strangled him if he had not been prevented; he then became steadily worse, complained of violent pains in his head, went out of doors on some excuse, and tried to drown himself in the River Steir, but was forcibly stopped by his son, who had watched and followed him. He was then taken to an asylum by gendarmes, where he died in three hours. François, on his part, calmed down on the morning of the 24th, and employed the day in inquiring about the robbery. By a strange chance, he crossed his brother's path at the moment when the latter was struggling with the gendarmes; then he himself became maddened, giving way to extravagant gestures and using incoherent language (similar to that of his brother). He then asked to be bled, which was done, and afterwards, declaring himself to be better, went out on the pretext of executing some commission, but really to drown himself in the River Steir, which he actually did, at the very spot where Martin had attempted to do the same thing a few hours previously.

The next point which I shall mention, in illustration of the extremely close resemblance between certain twins, is the

similarity in the association of their ideas. No less than eleven out of the thirty-five cases testify to this. They make the same remarks on the same occasion, begin singing the same song at the same moment, and so on; or one would commence a sentence, and the other would finish it. An observant friend graphically described to me the effect produced on her by two such twins whom she had met casually. She said: "Their teeth grew alike, they spoke alike and together, and said the same things, and seemed just like one person." One of the most curious anecdotes that I have received concerning this similarity of ideas was that one twin, A, who happened to be at a town in Scotland, bought a set of champagne glasses which caught his attention, as a surprise for his brother B; while, at the same time, B, being in England, bought a similar set of precisely the same pattern as a surprise for A. Other anecdotes of a like kind have reached me about these twins.

The last point to which I shall allude regards the tastes and dispositions of the thirty-five pairs of twins. In sixteen cases—that is, in nearly one-half of them—these were described as closely similar; in the remaining nineteen they were much alike, but subject to certain named differences. These differences belonged almost wholly to such groups of qualities as these: The one was the more vigorous, fearless, energetic; the other was gentle, clinging, and timid: or again, the one was more ardent, the other more calm and gentle: or again, the one was the more independent, original, and self-contained; the other the more generous, hasty, and vivacious. In short, the difference was that of intensity or energy in one or other of its protean forms; it did not extend more deeply into the structure of the characters. The more vivacious might be subdued by ill health, until he assumed the character of the other; or the latter might be raised by excellent health to that of the former. The difference was in the key-note, not in the melody.

It follows from what has been said concerning the similar dispositions of the twins, the similarity in the associations of their ideas, of their special ailments, and of their illnesses generally, that the resemblances are not superficial, but extremely intimate. I have only two cases altogether of a strong bodily resemblance being accompanied by mental diversity, and one case only of the converse kind. It must be remembered that the conditions which govern extreme likeness between twins are not the same as those between ordinary brothers and sisters (I have spoken of this in my memoir on the 'Theory of Heredity,' *Journal Anthropological Institute*, December, 1875, p. 329); and that it would be wholly incorrect to generalise from what has just been said about the twins, that mental and

bodily likeness are invariably co-ordinate, such being by no means the case.

We are now in a position to understand that the phrase "close similarity" is no exaggeration, and to realise the value of the evidence about to be adduced. Here are thirty-five cases of twins who were "closely alike" in body and mind when they were young, and who have been reared exactly alike up to their early manhood and womanhood. Since then the conditions of their lives have changed; what change of conditions has produced the most variation?

It was with no little interest that I searched the records of the thirty-five cases for an answer; and they gave an answer that was not altogether direct, but it was very distinct, and not at all what I had expected. They showed me that in some cases the resemblance of body and mind had continued unaltered up to old age, notwithstanding very different conditions of life; and they showed in the other cases that the parents ascribed such dissimilarity as there was wholly, or almost wholly to some form of illness. In four cases it was scarlet fever; in one case, typhus; in one, a slight effect was ascribed to a nervous fever; then I find effects from an Indian climate; from an illness (unnamed) of nine months' duration; from varicose veins; from a bad fracture of the leg, which prevented all active exercise afterwards; and there were three other cases of ill health. It will be sufficient to quote one of the returns; in this the father writes: "At birth they were *exactly* alike, except that one was born with a bad varicose affection, the effect of which had been to prevent any violent exercise, such as dancing or running, and, as she has grown older, to make her more serious and thoughtful. Had it not been for this infirmity, I think the two would have been as exactly alike as it is possible for two women to be, both mentally and physically; even now they are constantly mistaken for one another."

In only a very few cases is there some allusion to the dissimilarity being partly due to the combined action of many small influences, and in none of the 35 cases is it largely, much less wholly, ascribed to that cause. In not a single instance have I met with a word about the growing dissimilarity being due to the action of the firm freewill of one or both of the twins, which had triumphed over natural tendencies; and yet a large proportion of my correspondents happen to be clergymen whose bent of mind is opposed, as I feel assured from the tone of their letters, to a necessitarian view of life.

It has been remarked that a growing diversity between twins may be ascribed to the tardy development of naturally diverse qualities; but we have a right, upon the evidence I have

received, to go further than this. We have seen that a few twins retain their close resemblance through life; in other words, instances do exist of an apparently thorough similarity of nature, in which external circumstances do not create dissimilarity. Positive evidence, such as this, cannot be outweighed by any amount of negative evidence. Therefore, in those cases where there is a growing diversity, and where no external cause can be assigned either by the twins themselves or by their family for it, we may feel sure that it must be chiefly or altogether due to a want of thorough similarity in their nature. Nay, further, in some cases it is distinctly affirmed that the growing dissimilarity can be accounted for in no other way. We may therefore broadly conclude that the only circumstance, within the range of those by which persons of similar conditions of life are affected, capable of producing a marked effect on the character of adults, is illness or some accident which causes physical infirmity. The twins who closely resembled each other in childhood and early youth, and were reared under not very dissimilar conditions, either grow unlike through the development of natural characteristics which had lain dormant at first, or else they continue their lives, keeping time like two watches, hardly to be thrown out of accord except by some physical jar. Nature is far stronger than nurture within the limited range that I have been careful to assign to the latter.

The effect of illness, as shown by these replies, is great, and well deserves further consideration. It appears that the constitution of youth is not so elastic as we are apt to think, but that an attack, say of scarlet fever, leaves a permanent mark, easily to be measured by the present method of comparison. This recalls an impression made strongly on my mind several years ago, by the sight of some curves drawn by a mathematical friend. He took monthly measurements of the circumference of his children's heads during the first few years of their lives, and he laid down the successive measurements on the successive lines of a piece of ruled paper, by taking the edge of the paper as a base. He then joined the free ends of the lines, and so obtained a curve of growth. These curves had, on the whole, that regularity of sweep that might have been expected, but each of them showed occasional halts, like the landing places on a long flight of stairs. The development had been arrested by something, and was not made up for by after growth. Now, on the same piece of paper my friend had also registered the various infantine illnesses of the children, and corresponding to each illness was one of these halts. There remained no doubt in my mind that, if these illnesses had been warded off, the development of the children would have been increased by

almost the precise amount lost in these halts. In other words, the disease had drawn largely upon the capital, and not only on the income, of their constitutions. I hope these remarks may induce some men of science to repeat similar experiments on their children of the future. They may compress two years of a child's history on one side of a ruled half-sheet of foolscap paper, if they cause each successive line to stand for a successive month, beginning from the birth of the child; and if they mark off the measurements by laying, not the 0-inch division of the tape against the edge of the pages, but, say, the 10-inch division—in order to economise space.

The steady and pitiless march of the hidden weaknesses in our constitutions, through illness to death, is painfully revealed by these histories of twins. We are too apt to look upon illness and death as capricious events, and there are some who ascribe them to the direct effect of supernatural interference, whereas the fact of the maladies of two twins being continually alike, shows that illness and death are necessary incidents in a regular sequence of constitutional changes, beginning at birth, upon which external circumstances have, on the whole, very small effect. In cases where the maladies of the twins are continually alike, the clocks of their two lives move regularly on, and at the same rate, governed by their internal mechanism. When the hands approach the hour mark, there are sudden clicks, followed by a whirring of wheels; the moment that they touch it, the strokes fall. Necessitarians may derive new arguments from the life histories of twins.

We will now consider the converse side of our subject, which appears to me even the more important of the two, though I had little suspected it would be so, when I first began the inquiry. Hitherto we have investigated cases where the similarity at first was close, but afterwards became less; now we will examine those in which there was great dissimilarity at first, and will see how far an identity of nurture in childhood and youth tended to assimilate them. As has been already mentioned, there is a large proportion of cases of sharply contrasted characteristics, both of body and mind, among twins. I have twenty such cases, given with much detail. It is a fact that extreme dissimilarity, such as existed between Esau and Jacob, is a no less marked peculiarity in twins of the same sex, than extreme similarity. On this curious point, and on much else in the history of twins, I have many remarks to make, but this is not the place to make them.

The evidence given by the twenty cases above mentioned is absolutely accordant, so that the character of the whole may be exactly conveyed by two or three quotations. One parent

says: "They have had *exactly the same nurture* from their birth up to the present time; they are both perfectly healthy and strong, yet they are otherwise as dissimilar as two boys could be, physically, mentally, and in their emotional nature." Here is another case: "I can answer most decidedly that the twins have been perfectly dissimilar in character, habits, and likeness from the moment of their birth to the present time, though they were nursed by the same woman, went to school together, and were never separated till the age of fifteen." Here again is one more, in which the father remarks: "They were curiously different in body and mind from their birth." The surviving twin (a senior wrangler of Cambridge) adds: "A fact struck all our school contemporaries, that my brother and I were complementary, so to speak, in point of ability and disposition. He was contemplative, poetical, and literary to a remarkable degree, showing great power in that line. I was practical, mathematical, and linguistic. Between us we should have made a very decent sort of a man." I could quote others just as strong as these, in some of which the word "complementary" again appears, while I have not a single case in which my correspondents speak of originally dissimilar characters having become assimilated through identity of nurture. The impression that all this evidence leaves on the mind is one of some wonder whether nurture can do anything at all, beyond giving instruction and professional training. It emphatically corroborates and goes far beyond the conclusions to which we had already been driven by the cases of similarity. In these, the causes of divergence began to act about the period of adult life, when the characters had become somewhat fixed; but here the causes conducive to assimilation began to act from the earliest moment of the existence of the twins, when the disposition was most pliant, and they were continuous until the period of adult life. There is no escape from the conclusion that nature prevails enormously over nurture when the differences of nurture do not exceed what is commonly to be found among persons of the same rank of society and in the same country. My only fear is, that my evidence seems to prove too much, and may be discredited on that account, as it seems contrary to all experience that nurture should go for so little. But experience is often fallacious in ascribing great effects to trifling circumstances. Many a person has amused himself with throwing bits of stick into a tiny brook and watching their progress; how they are arrested, first by one chance obstacle, then by another; and again, how their onward course is facilitated by a combination of circumstances. He might ascribe much importance to each of these events, and think how largely the destiny of the stick

had been governed by a series of trifling accidents. Nevertheless all the sticks succeed in passing down the current, and they travel, in the long run, at nearly the same rate. So it is with life, in respect to the several accidents which seem to have had a great effect upon our careers. The one element, which varies in different individuals, but is constant in each of them, is the natural tendency; it corresponds to the current in the stream, and inevitably asserts itself.

Much stress is laid on the persistence of moral impressions made in childhood, and the conclusion is drawn, that the effects of early teaching generally, must be important in a corresponding degree. I acknowledge the fact, but doubt the deduction. The child is usually taught by its parents, and their teachings are of an exceptional character, for the following reason. There is commonly a strong resemblance, owing to inheritance, between the dispositions of the child and its parents. They are able to understand the ways of one another more intimately than is possible to persons not of the same blood, and the child instinctively assimilates the habits and ways of thought of its parents. Its disposition is "educated" by them, in the true sense of the word; that is to say, it is evoked earlier than it would otherwise have been. On these grounds, I ascribe the persistence of habits that date from the early periods of home education, to the peculiarities of the instructors, rather than to the period when the instruction was given. The marks left on the memory by the instructions of a foster-mother are soon spunged clean away. Consider the history of the cuckoo, which is reared exclusively by foster-mothers. It is probable that nearly every young cuckoo, during a series of many hundred generations, has been brought up in a family whose language is a chirp and a twitter. But the cuckoo cannot or will not adopt that language, or any other of the habits of its foster-parents. It leaves its birthplace as soon as it is able, and finds out its own kith and kin, and identifies itself henceforth with them. So completely is its change of life carried out, and so utterly are its earliest instructions in an alien bird-language neglected, that the note of the cuckoo tribe is singularly correct. Mr. Romanes tells me that he has compared the cuckoo's note with a tuning-fork, at home and abroad, and has found it to be identically the same in both cases.

Much might finally be said in qualification of the broad conclusions to which we have arrived, as to certain points in which education appears to create a permanent effect, partly by training the intellect, and partly by subjecting the boy to a higher or lower tone of public opinion; but this is foreign to my immediate object. The latter has been to show broadly,

and, I trust, convincingly, that statistical estimation of natural gifts by a comparison of successes in life, is not open to the objection stated at the beginning of this memoir. We have only to take reasonable care in selecting our statistics, and then we may safely ignore the many small differences in nurture which are sure to have characterised each individual case.

THE JOURNAL
OF THE
ANTHROPOLOGICAL INSTITUTE
OF
GREAT BRITAIN AND IRELAND.

DECEMBER 14TH, 1875.

Colonel A. LANE FOX, *President, in the Chair.*

The minutes of the previous meeting were read and confirmed.

W. A. JEVONS, Esq., of Southport, was elected a member.

The following presents were announced, and the thanks of the meeting were voted for the same, viz:—

FOR THE LIBRARY.

From the SOCIETY.—Journal of the Asiatic Society of Bengal. Vol. XLIII. Part 2, extra Number.

From the EDITOR.—La Conversazione. No. 1, 1875.

From JAMES BURNS, Esq.—Human Nature for November, 1875.

From the EDITOR.—Materiaux pour l'Histoire de l'Homme. Vol. VI. Nos. 10 and 11.

From the ANTHROPOLOGICAL SOCIETY OF BERLIN.—Zeitschrift für Ethnologie. Nos. 1 to 4, 1875.

From the EDITOR.—Revue Scientifique. Nos. 22 to 24, 1875.

From the ANTHROPOLOGICAL SOCIETY OF SPAIN.—Revista de Antropologia. Vol. II. No. 8.

From the INSTITUTION.—Journal of the Royal United Service Institution. Vol. XIX. No. 83.

From the AUTHOR.—Les Crânes des tumuli de la Pakuti. By Dr. J. Kopernicki.

From the Rt. Hon. Lord ARTHUR RUSSELL, M.P.—Papers, &c., relating to the Ashantee Invasion. Nos. 1 to 9. Ditto, Abolition of Slavery on the Gold Coast. Papers and Reports on the late Kafir Outbreak. Ditto, relating to the Slave Trade; Nos. 2, 3, 7, and 9. Ditto, relating to Drought in Bengal. Report of Commodore Goodenough and Consul Layard on the

offer of the Cession of the Fiji Islands to the British Crown.
 Report on the South Sea Islands. Ditto, on Coolie Immigration.
 Pacific Islands Protection Bill, &c.
 From the EDITOR.—Nature (to date).

The following paper was read by the author :

On the BELIEF in BHUTAS—DEVIL and GHOST WORSHIP in WESTERN INDIA. By M. J. WALHOUSE, F.R.A.S.

ALTHOUGH the lower castes and classes in India acknowledge and reverence the Brahmanical gods, their familiar household cultus is much more especially addressed to inferior supernatural beings analogous to the evil spirits, devils, ghosts, and goblins of European superstition. According to Hindu doctrine there are ten classes of such beings, the first seven of which are demons, created aboriginally with the world, or by acts of the higher gods, on whom they wait as attendants or servants, receiving some share of their worship, and avenging any omission or neglect of ceremonies due. Though not invariably, they are for the most part evilly-disposed towards human kind, especially the female powers amongst them, which are many. But the last three classes, of whom more particularly it is now intended to speak, are of exclusively human origin, being malignant, discontented beings, wandering in an intermediate state between Heaven and Hell, intent upon mischief and annoyance to mortals; chiefly by means of possession and wicked inspiration, every aspect of which ancient ideas, as well as of the old doctrine of transmigration, they exemplify and illustrate. They are known by the names of Bhūta*, Prēta, and Pisācha; the first name being ordinarily applied to all three, and even vulgarly to the seven superior classes. These beings, always evil, originate from the souls of those who have died untimely or violent deaths, or been deformed, idiotic, or insane; afflicted with fits or unusual ailments; or drunken, dissolute, or wicked during life. The precise distinction between the three classes is that the Prēta is a ghost of a child dying in infancy, or of one born deformed, imperfect, or monstrous; events attributed to neglect in performing certain ceremonies prescribed during the ten days when, according to popular notions, the limbs of the embryo are forming in the womb: such a ghost becomes a misshapen, distorted goblin. The Pisācha, on the other hand, is derived rather from mental characteristics, and is the ghost

* *Bhūtas*.—"Malignant spirits, goblins, or ghosts, haunting cemeteries, lurking in trees, animating dead bodies, and deluding and devouring human beings."—Thompson.

of madmen, habitual drunkards, the treacherous and violent-tempered, as though realising the idea that the evils that men do live after them in the guise of malicious spirits. Bhūtas, however, emanate from those who die in any unusual way, by violence, accident, suicide, or sentence of law; or who have been robbers, notorious evil-doers, or dreaded for cruelty and violence. The death of any well-known bad character is a source of terror to all his neighbourhood, as he is sure to become a Bhūta or demon, as powerful and malignant as he was in life. Some of the Bhūtas now most dreaded were celebrated personages of old days. All such persons on death are liable to become Bhūtas, and attach themselves to any beings of the higher classes whom they first meet on entering the spirit-world, and derive from them power and assistance in tormenting and afflicting men and animals. As an example of how forcibly this idea possesses the popular mind, I will read an extract from a recent Indian newspaper:—"We learn from a correspondent at Cochin, that, a couple of days before the Christmas holidays, a Nair of Chenganoor, in cold blood, murdered his paramour, on suspicion of her infidelity. The noteworthy and strange feature of the case is, that when he was taken up and arraigned before the Sessions Court, he pleaded 'guilty' to the charge, but earnestly implored that the extreme penalty of the law, which he admitted he fully deserved, might be carried out, not at the usual place of execution, but at the scene of his crime, in order that he might, according to his theory of the transmigration of the soul, assume the form and life of a 'demon,' and thereby have full scope for revenging himself on the man and his associates who were the cause of leading his unfortunate victim astray." It is also held that by certain ceremonies and expiation this form of existence can be dissolved, and the unquiet spirits remitted to regions of reward or punishment, according to their deserts on earth.

In their haunts and modes of appearance Bhūtas repeat the popular beliefs of many countries. They wander borne upon the air, especially in uninhabited, dry, and desert places; and tall trees are a favourite abode. The third watch of the night, or from 12 to 3 o'clock, is the time when they wander abroad most freely; and belated travellers sometimes meet them then in the shape of dark shadows. As the ancient Jews would speak to none whom they met after midnight, for fear they might be addressing a devil, so Hindu villagers will speak to no one they may meet at that time, lest he should be a Bhūt, nor, indeed, willingly then stir out of their houses. The eddies of wind that career over plains in the hot weather, whirling up leaves and columns of dust, and flickering lights

seen gliding over marshes, are regarded as Bhūts passing by. Objects seen indistinctly moving in the dusk or mists, are attributed to them; and so, indeed, are all visions.

Of calling shapes and beckoning shadows dire,
And airy tongues that syllable men's names
On sands, and shores, and desert wildernesses.

The Gools of Arabian superstition closely resemble Bhūtas, assuming monstrous shapes of men or animals, frequenting desert places and burial grounds, and feeding on carcasses.

The before-mentioned classes are believed more particularly to afflict human beings by entering into and possessing them. Gaping or drawing deep breaths are supposed to give them opportunities for this, and no Brahman ever gapes without snapping his fingers before his mouth, as a charm to prevent an evil spirit entering. After gaining an entrance, they seat themselves in the lower part of the abdomen, and feed upon all the unclean excreta. Whilst so dwelling they are held, by interrupting digestion and circulation of the humours, to cause fits, paralytic strokes, temporary aberrations, outbreaks of madness, cramps, and rheumatic pains. All this closely tallies with the beliefs regarding possession current amongst the Jews and early Christians; the former in particular believing that unclean spirits, by reason of their tenuity, were inhaled and insinuated themselves into the human body, injuring health through the viscera, and forcing the patients to fulfil their evil desires. The grosser parts of the body and all unclean places were their especial abodes, and an evil spirit was declared by the Rabbins to inhabit every privy in the world. Besides diseases and bodily afflictions, the evil influence of Bhūtas is believed to occasion family discord, hatred between brothers, ill-temper and gloominess, the death of children during the life of parents, the non-survival of births, barrenness in women, atheism, and neglect of religious ceremonies. Although, properly speaking, they are not held to have power over human life, the villagers and common people believe they have, and outbreaks of disease, sudden deaths, and wasting away are always ascribed to their malignant power. Cattle diseases of every kind are invariably attributed to them, as in Scotland and Ireland to elf-bolts, as celts and flint arrowheads were called, and popularly supposed to be missiles formed and discharged by malicious fairies: an imagination commemorated by Collins in his *Ode on Highland Superstitions*:

There every herd by sad experience knows
How, wing'd by fate, the elf-shot arrows fly.

It may be readily conceived that superstitions like these, entering into every part of daily life, would exercise a much

deeper influence over a sequestered, ignorant rural population, than the loftier, more abstract Aryan conceptions; and they are also distinctly Turanian, to which race the great underlying stratum of the population of India appears to have belonged, and over which the subsequent Aryan invasion spread itself, each in the course of ages influencing the other, characteristics of the one cropping up, and of the other filtering down. All demonologies and ghost-systems belong to the Turanian races, and are antagonistic to the Aryan genius and feelings, though, after ages of intercourse and blending, some of the superstitions of the lower race may have crept into the intellect of the higher.*

In proceeding now to give some account of the ceremonies and worship paid to the Bhūtas, I shall confine myself principally to those current in Canara, on the Western Coast of India. The same cultus, with some variations, obtains, however, all over India and Eastern and Northern Asia; the Bhūta belief being found everywhere under different names and forms.

The edifices and observances connected with Bhūta worship are both domestic and public. In villages, and very generally in towns, there is in every house a wooden cot or cradle, placed on the ground or suspended by ropes or chains, and dedicated to the Bhūta of the spot. On these are placed a bell, a knife, or sword, and a pot filled with water, all which are collectively called the Bhandāra of the Bhūta, and kept either in a part of the house itself, or in a small separate building. The idea seems to be of placating the spirit that haunts the spot by making a sort of abode for it, much in the same way as the cream-bowl was nightly set for the "drudging goblin," or brownie, in England. On the last day of every lunar month flowers are laid on the cot, and perfume burnt before it; and once a year, towards the end of April, a ceremony called Tambāla is performed. First, a fire is lit on the spot where the cot and paraphernalia stand, to make it "shoodha," *i.e.* clean; then fried rice, mixed with coarse sugar and grated cocoanut kernel, is heaped on two plantain leaves, which are placed on the cot, together with some young cocoanuts, pierced ready to drink from. A ball is then formed of boiled rice, coloured yellow with turmeric, and laid on a piece of plaintain-leaf on a small stool, which is placed before the cot, and a lighted torch stuck on it. A fowl is held above the rice-ball and torch, its throat cut, and the blood let drop upon the ball; some perfume is burnt, and the ceremony ends. The cocoanuts placed on the

* A trace of this is, perhaps, seen in the Laws of Manu, where (xii. 71-2) it is declared that a Kshatrya who neglects his duties will, at the after-birth, be changed into a demon that feeds on ordure and carrion; and a Sudra into an evil being, that eats rotten carcases—that is, into Bhūtas.

cot are then taken and dashed on the ground, or cloven in half. If the pieces fall with the kernel upward, it signifies the Bhūta is pleased with the offering; if with the kernel downward, the reverse. Should a member of the family be stricken with any unusual attack, such as apoplexy, paralysis, cholera, &c., or should disease break out amongst the cattle, it is at once ascribed to the anger of the Bhūt, and a propitiatory sacrifice is offered. A fowl is turned three times round before the patient's face, its neck then twisted, and the blood let fall upon him, and some rubbed on his forehead and joints, the meaning being to offer life for life—the fowl in lieu of the man. Powdered sandal-wood is then sprinkled over the Bhūta's cot, and water from the pot kept there dashed upon the sick man's forehead and eyes. The family priest is then consulted, who, after much grave meditation, usually recommends alms to be given to himself to satisfy the hostile stars, with a promise to perform a special ceremony to the Bhūta, and give a banquet to all the patient's castemen should he recover. Medicine is not neglected, but, in event of recovery, the credit is ascribed to the influence of the Bhūta.

The general buildings dedicated to these demons are called Bhūtaṣṭāns, and when dedicated to one of the superior, or very popular Bhūtas, sometimes of considerable size; but far more commonly a small plain structure, four or five yards deep, by two or three wide, with a door at one end, covered by a portico supported on two pillars, with a thatched roof, and windowless. In front of it there are usually three or four T-shaped pillars, the use of which is not clear. They are said to denote that the building is a Bhūtaṣṭān, and flowers are placed, and cocoanuts broken on them at ceremonies. It may be worth noticing that pillars of exactly the same shape are found accompanying the mysterious Balearic Talyots, the purpose of which has hitherto baffled antiquaries. Inside the Bhūtaṣṭān there is usually a number of images roughly made in brass in human shape, or resembling animals, such as pigs,* tigers, fowls, &c. These are brought out and worshipped as symbols of the Bhūtas on various ceremonial occasions. The Bhūtas themselves are usually represented by mere rough stones. Some of the brass figures are now on the table, and the difference between the Turanian and Aryan mind will appear on comparing these rude village idols with images of the Brahmanical gods. Brass basins, bells, a peculiarly-shaped sword, and some other articles used at ablutions are also kept within. These rustic fanes are thickly scattered over

* In the British Museum there are some marble images of swine, sacred to Persephone, found in the temenos of the temple of Demeter at Cnidus, which may have been offerings, like these Indian ones of brass.

the face of the country in very various situations—under a green tree, on hill-sides, down in hollows, in jungles, on plains, by roadsides, in villages, amid rice-fields, but always on a small plot of waste ground, which is kept uncultivated, like the "guid-man's croft" in Scotland. A rough drawing of one of ordinary size and appearance is annexed.

Once a year a festival called Kolla is held at the village Bhūtastān, in honour of the local Bhūta, at which all the villagers attend. There is no fixed time for this, but the village priest, after consulting with the principal inhabitants, determines an auspicious day. This being settled, a tall pole is fixed upright in the ground before the Bhūtastān, and a flag, that is always kept within, hoisted upon it. The Bhūt's Bhandāra, or paraphernalia, and the images, &c., are brought out and cleaned, and a large fire kindled to purify the spot. The festival always takes place at night, and about 9 o'clock all the villagers assemble in their best attire, the women wearing all their ornaments, and their heads, as well as often the men's, thickly garlanded with flowers. Tom-toms and drums are beaten, and the Pujāri, or priest, takes the Bhūta-sword and bell in his hands, and whirls round and round, imitating the supposed mien and gestures of the demon. But he does not aspire to full possession, which in aboriginal rites like these is only given to a representative of the aboriginal tribes, now the lowest castes. A Dhér, one of the slave caste, at other times regarded with contempt, but now advanced to the foremost post, comes forward naked, save a waist-band, and with all his head and body grotesquely and frightfully besmeared with white, yellow, and red paint. Over his head, and tied to his back, there is a sort of an arch, termed Ani, made of green cocoa-tree leaves, with their ends radiating out. For some time he paces up and down, within a ring formed by the crowd, flinging about his arms, gesticulating wildly, leaping, and shaking his body furiously. Meanwhile a dozen or more tom-toms and drums are beaten incessantly and stunningly, with a continually increasing din; and the Dhér presently breaks into a maniac dance, capering, bounding, and spinning vehemently, whilst the instruments redouble their noise, the power of the Bhūta being estimated by the fury and persistence with which the Dhér dances. The multitude around joins in raising a long, monotonous, howling cry, with a peculiar vibration. At length the Dhér stops, he is full of the demon, and stands fixed and rigid, with staring eyes. Presently he speaks, or rather the demon speaks from him, in loud, hoarse, commanding tones, wholly unlike his own, or indeed any natural voice. He addresses the head man of the village first, and then the principal inhabitants in due order, for any neglect of etiquette on this point by

the Bhūta would infallibly give rise to great resentment. After thus speaking to the principal villagers and asking whether all the people are present, the possessed Dhér goes on to say that the Bhūta is pleased with the performance of the ceremony, and exhorts all the people to behave justly and charitably to one another. Various disputes and litigated matters, especially when evidence and ordinary means of adjustment fail, are then brought forward and submitted to the decision of the Bhūta, and his award, pronounced through the Dhér, is generally, though not always, submitted to. After this the demon desires to have food, and the Dhér eats fried rice and drinks the milk of young cocoanuts; or, if the demon he represents be one of low degree, he eats animal food and drinks arrack. He then distributes areca flowers and pieces of cocoa-nut to all assembled in due order of precedence, and the Bhūta passes away from him, he loses his commanding mien and tones, and relapses into the servile drudge. The assembly then addresses itself to festivity; there is much drinking of arrack, the drumming and wild music go on vehemently, interminable songs are sung, and at the first dawn the people disperse on all sides to their homes. The houses and farmsteads composing a village in Canara lie widely scattered over a surface picturesquely diversified with hill and hollow; and not unfrequently, when riding over the country before sunrise, as Anglo-Indians do, I have met long files and troops of people returning from these nightly celebrations. They are a tall and comely race on that western coast, and looking at the women, with their many-coloured, classically-adjusted garments and garlanded heads, I have thought that troops of Bacchantes or Mænads descending from the valleys of Cithæron, where all night long the tambour and cymbals had been resounding, and the torches flaming beneath the pine trees, might not have been so dissimilar to them, and that had we exact details of the wild Bacchic orgies and rites of the Mighty Mother, manifestations might be disclosed not distantly akin to those now witnessed in the East.* It may not even be too bold to conjecture that a cultus springing from the same general idea, namely, demons or the dead, speaking through the living, may have existed in German and Gaulish forests or British valleys in the ages before the Roman invasion; and that much, looking that way, might have been picked up by any Latin archæologist who troubled

* Circe, whose name is derived from the whirling magic dance, with her herd of transformed Bhūta-like votaries, may be also cited; and the Salii, or leaping priests of early Rome. Compare, too, in Arabian story, the striking picture in Southey's "Thalaba" (Cant. ix.), of the terrible witch Khawla, possessed by Eblis, and uttering inspired warnings after wild gyrations and a bloody sacrifice: a shadow of such rites may survive in the spinning Dervishes to-day.

himself about barbarian folk-lore. Cæsar and Tacitus record only the names and rites of the higher gods, just as the English in India know generally something of Shiva and Vishnu, and the principal Brahmanical deities, but seldom anything of the obscurer divinities and worship of the common people.

It is indeed striking to survey how ancient and how widely spread are the ideas and observances already described. In Tinnevely, the extreme southern province of the Indian peninsula, the popular cultus is devil-worship, essentially the same as the Bhûta-worship of Canara, and has been described minutely by the Rev. R. Caldwell, of the Tinnevely Mission. There the devil-dancer, as the officiating person is called, grotesquely arrayed and bedizened, dances, with gradually increasing frenzy, to the quickening clamour of drums and cymbals, whirling and leaping till the afflatus descends; then, when under full control of the demon, he is worshipped as a present deity, and consulted by the bystanders respecting their diseases, wants, and the welfare of absent relations. Mr. Caldwell has also pointed out that all such observances are identical, point for point, with the Shamanite worship of Siberia, the hill-tribes of South-western China, and of Northern Asia, as the subjoined passage will show:—
“When the Shaman, or magician, performs his rites, he puts on a garment trimmed with rattles and bells, he cries horribly, shakes his robe, beats a drum, whilst the bystanders increase the din by striking on iron kettles. When the Shaman by his contortions, yells, and whirling has succeeded in assuming the appearance of something preternatural, the assembled multitude are impressed with the belief that the demon has taken possession of him, and regard him with wonder and dread. When quite exhausted he makes a sign that the spirit has left him, and then imparts to the people the intimation he has received.” As Mr. Caldwell remarks, such identity of usages is evidence of a common origin. I have witnessed oracular responses given under the supposed control of a demon, after gesticulatory dances amongst that peculiar tribe, often mentioned before this Society, the Todas of the Nilgiri Hills. In Siam spirit-dances are held in a shed built for the purpose, in which offerings are set out for the demon, who is invited by the usual wild music to come down to the dance; but there is this peculiarity, that there the demon always enters a woman, which is scarcely ever heard of in India. She herself does not dance, but bathes and rubs herself with scent, dresses in a red waistcloth and dark silken jacket, and awaits the descent of the demon, who is incited to come by redoubled din of music and chanted incantations. When he comes she shakes and trembles, and then, assuming the airs and manners of a great personage, all present worship and pay her homage.

Sometimes the spirit of one of their ancestors, sometimes a foreign demon, is supposed to have taken possession of her body. She answers questions, and gives commands and directions in a haughty, imperative tone, and all her words are humbly listened to, and afterwards she partakes of the offerings provided for the demon. An old woman usually plays the part, and after the influence has left her, she declares she knows nothing of what took place, or what she may have said. All these practices are in full force amongst the Chinese, and are described in the most ancient Chinese works "by the Emperor Fuhi, probably nearly 3,000 B.C.," says the Rev. Mr. Nevius, in his work, "China and the Chinese." "They burn incense, beat a drum to call the attention of the desired spirit," writes Padre de Mae, "and then by idolatrous methods, one of which is a spasmodic ecstasy, they get responses from the dead." Had Mr. Layard penetrated more fully into the meaning of the wild rites and dances of the Yezidis, or devil-worshippers, of Kurdistan, which he describes so vividly in his work, "Nineveh and its Remains" (vol. i. 293), or been admitted further into the secrets of the cultus, the same belief and manifestations would probably have been found to be at its root. In New Zealand the Tohunga, or priests, evoke after certain wild ceremonies the spirits of the dead, who speak through them in strange, unearthly tones. Nearly the same practices have lately been described as prevailing amongst the Greenland Eskimo. Other instances might be cited of these ideas and usages in widely-separated nations; and amongst ourselves a trace or survival of them may perhaps be discerned in the unknown tongues of the Irvingites, which were said frequently to break forth after violent contortions; amongst the Shakers and Jumpers, too, of America and England, rapturous prayers and adjurations are reported to be sometimes uttered after violent, prolonged dancing,* and in Spiritualist circles manifestations are said to be much assisted by those present joining in hymns and singing.

In face of the vast array of learning, and instances bearing on the subject, brought together with such marvellous labour and

* The newspapers contain a report of an extraordinary scene at Exeter last week (December, 1875), when "Mother Girling," the head of the New Forest Shakers, gave a lecture at that place.

"Mrs. Girling was listened to with some attention at first, but the audience soon began hissing and cheering. Suddenly one of the eight girls who accompanied the lecturer rose from her seat, and began to dance, with eyes closed, and arms waving to and fro. This demonstration (says the *Western Morning News*) caused loud laughter at first, followed by groans and hisses, which were redoubled when Mrs. Girling explained that it was the operation of the Spirit. The dancing girl next commenced singing snatches of hymns, and one of her companions fainted for a moment and then began to dance as well. Great disorder followed. Appeals were made to the Shakers to stop the dancing, to which they replied they had no

research in Mr. Tylor's chapters on "Animism," one cannot but feel that a paper like this is superfluous. But if the almost universal belief, amongst the lower races, in their continued existence after the death of the body, may have arisen from the conclusion that the figures of the dead, seen in dreams and visions, must be their surviving souls, it may be allowable to reflect how much that supposition would have been strengthened by believing their voices were heard after death speaking to their tribe and followers. It is amongst the most primitive and savage races that such beliefs are at this day current. Modern industry and investigation are piercing somewhat further into the dim and misty morning of the yesterday we have hitherto styled antiquity; but what papyrus roll or burnt-clay cylinder will disclose what was the creed and what the gods of the flint-folk, or what the thoughts as to a hereafter of the man who traced the outline of the Mammoth on the piece of tusk in the Christie collection? These are beyond surmise, except forasmuch as those races, being human, must have dreamed dreams and seen in them the departed in their habit as they lived; and as there may have been some subject to those strange, delirious ecstasies, natural or produced, in which the very voices of the dead are imagined to be heard again, it may not be too bold to conjecture that the wild cultus and ceremonies described above may have originated in that "dim, backward, and abysm of time" and antiquity of man of which only late years have given us definite assurance. A short reference may here be made to the dancing mania, which, beginning in 1374, for two centuries plagued Germany and the adjacent countries. The amazing details respecting it may be read in Dr. Hecker's "Epidemics of the Middle Ages." Whole communities were seized with a disease of frantic dancing, continued for hours and days, during which they neither saw nor heard things external, but were haunted by visions and spirits whose names they shrieked out. Intoxicating music increased and spread the delirium, and streets and cities were filled with hundreds of raving dancers of both sexes: the disease was universally ascribed to demoniacal origin. Sympathy and contagion may have been much concerned with this strange phenomenon, often called St. John's Dance, but its roots probably existed in primitive heathen observances connected with St.

power to do so. By this time the number of dancers had increased, and a rush was made to the platform, which was speedily occupied. The scene at this time defies description—three or four girls with dishevelled hair, and faces streaming with perspiration, dancing within a circle of policemen, and an infuriated mob trying to get at them and their companions, and hustle them from the platform. One of the men of the Shaker party, who had up to this time remained comparatively cool and collected, suddenly commenced to jump, and defied the efforts of three or four stalwart men to keep him still."

John's Day.* Beside numberless local Bhūtas there are some thirty especially feared in Canara, possessing temples and shrines in various parts of the province: several are females. The most dreaded and malignant amongst them is Kālkātti, or the Stonecutter, reputed to be the spirit of Jackanachāri, a famous stonemason and architect, who between four and five centuries ago built most of the exquisitely beautiful Jaina temples that exist in Canara. Much legend has gathered about him, but he undoubtedly lived, and must have been a craftsman of marvellous skill. The tradition runs that he and his wife, having quarrelled with their son respecting a temple then in process of building, they both committed suicide and became Bhūtas so malign and feared that none dare attempt an exorcism when their presence is suspected. The next most dreaded Bhūta is *Panjurli*, i.e. pig-rider, whose origin is forgotten, but is probably the perturbed spirit of some one once notorious. *Gūliga* is regarded as an aboriginal or earth-born demon, and has power during certain minutes on certain days to pass through the air, and strike those he meets with a rod, thereby causing fits, paralysis, or even death. His glance also causes sickness, but the hours in which, in Shakspeare's sense, he can *take*† or injure, are limited. *Chamundi*, signifying mistress of death, is a female earth-spirit,‡ and when the Kolla ceremony is offered to her, a large pile of wood is kindled, and after it has become a heap of glowing embers, the Dhēr who represents and is possessed by her, dances and rolls upon them for some minutes without injury. *Munditāya* is the ghost of a Balala, or high casteman, who died by some accident, and is reputed very troublesome; sandal-wood powder and water, taken from the cot hung up to him, are, however, believed, when rubbed on, to cure snake-bites without further remedy. Most Bhūtas haunt large trees, and it is of this last one, I think, that a story is told regarding a large solitary Banian tree near a village in the province. A demon was said to live in its branches, and none dare climb it. Some Mussulmans, however, laughed at the story, and one of them climbed

* The subjoined notice of a picture, entitled "*La Saint-Jean*," by M. Jules Breton, representing, it is understood, an actual scene in Brittany, is not irrelevant to the general subject of this paper. "The subject is the immemorial custom of dancing round fires on St. John's Day—a custom by no means quite disused in England, and still frequent in France. A group of stalwart and rough country wenches are dancing furiously, and, with the utmost rapidity, circling about a huge bonfire which has been made on a village green. The red and orange flames rise and flash in the air between the figures; the women seem to be singing as if they were mad. In the distance are other figures, bearing and waving torches."

† "then no planet strikes,

No fairy takes."—*Hamlet*.

‡ Also called the tigress, and identified with the most cruel aspect of Parvati, the wife of Shiva.

up, but when he had got well up in the branches, the goblin was suddenly revealed to him in a monstrous and frightful shape, on seeing which he screeched, let go his hold, fell to the ground, and remained raving with terror for three days; his back was injured by the fall and he became hump-backed, but lived to be 90, and would often tell the story. The tree is now half-dead, and limbs and branches often fall from it, but none will go near or pick them up. So in Denmark and Norway the elf-people frequent large linden trees, and it is not held safe to break their branches or go near them after dusk. The Dhārmāstal Temple,* situated in a wild forest track in Canara, is one of the most famous in all that part of the peninsula, and is the abode of seven or eight very powerful Bhūtas, who are so dreaded that none will assume their names. In civil suits, when the evidence is balanced or hopelessly contradictory, it is very usual for one of the parties to offer to decide it by taking an oath as to the justice of his contention before one of the Dhārmāstal deities: this, when accepted and done with certain formalities, is always held satisfactory and decisive; for the litigants know well that no one would dare to risk abiding the vengeance of those terrible Bhūtas by a false adjuration. With respect to assuming their names, it may be explained that it is very common to name children after any Bhūta who may be very popular at the time, probably with the idea that the compliment might induce him to regard the child and family with favour. I remember that a good many years ago a notorious and greatly dreaded dacoit was hung in Trichinopoly, who after death became so fashionable a Bhūt that for some time half the children born were named after him. I may perhaps mention two or three out of the instances of the belief in Bhūtas that came before me officially as judge. In a trial for murder before the Sessions Court, the prisoner was charged with having intentionally caused the death of his younger brother, whom he struck down as they were ploughing. In defence the prisoner stated, through his vakil, or pleader, that the deceased whilst at work in the field was struck by the eye of a Bhūt, of which he died; and his witnesses deposed that they had known similar instances. In another murder case the evidence of a material witness was objected to because he was well known to be under the curse of a Bhūt, and in consequence a desperate man, whose statements could not be believed. Again, a Potél, or village head-man, was charged with having entered the death of a boy in his register as natural, when he had really committed suicide:

* Round stones are sold at this temple, which are believed to carry the power of the Bhūtas with them; they receive offerings, and can be invoked against any enemy, who will forthwith be visited by all sorts of misfortunes.

in defence the Potél asserted that the boy had died from a blow by the village Bhūt, and named several similar instances. On being punished by the magistrate, he appealed to the Sessions Court, reasserting his plea, and desiring to call witnesses to prove it. These men were far from unintelligent, and the vakils, or native pleaders, acute and well able to conduct a legal argument. But we can hardly ridicule them much, when we reflect that within the last eighteen months a young farmer was sentenced to six months' imprisonment at Dorchester for savagely beating an old woman because she "hag-rode" him; another man in Somersetshire was charged for twice stabbing a woman who had "over-looked" him, that he might break the spell with her blood; and there were four other convictions, in Somersetshire and Devonshire alone, for assaults committed, or payment taken, on account of, or to cure, having been bewitched: and all the persons connected may presumably have been at school, and attended some church or chapel.*

Very often Bhūtas become a sort of house-spirits, such as are heard of in many popular mythologies, more or less mischievous and delighting in Robin Goodfellow's pranks. Howlings and unearthly shrieks and noises that cannot be traced are attributed to them. Household utensils are thrown about, and stones flung by invisible hands,† and pots and cooking vessels found filled with dirt. Women put away their best clothes carefully, and in the morning find them unaccountably on fire and smouldering away. All these are ascribed to the Bhūta, as well as what would now be called a kind of levitation, which is declared to be very frequent. Infants are missed from their cradles, and presently heard crying in the loft of the house, or on stacks of straw outside. Once riding through a village, I found the people in great excitement at a prank played by a Bhūta two days before. A woman lying apart in her room, expecting her confinement, was suddenly missed, and could nowhere be found, till some children heard her voice proceeding from a dry well in a field hard by. She was drawn up with considerable trouble,

* Since writing this it has struck me that some apology is due, both to our English and Indian west country rustics. Within the last few months a work ("Glimpses of the Supernatural") has been published by a well-known clergyman, the vicar of an important London parish, in which stories of witchcraft and injuries done by witches, the calling up and dismissal of spirits by magic rites, appearances of demons, demoniacal possession, and the like, are recounted with apparently full belief. In a remarkable article on "Demonology and Devil-dancing," in the *Contemporary Review* for February of the current year, Mr. R. Caldwell asks whether instances of demoniacal possession, such as are related in the New Testament, may not occur to-day in India and less civilised countries.

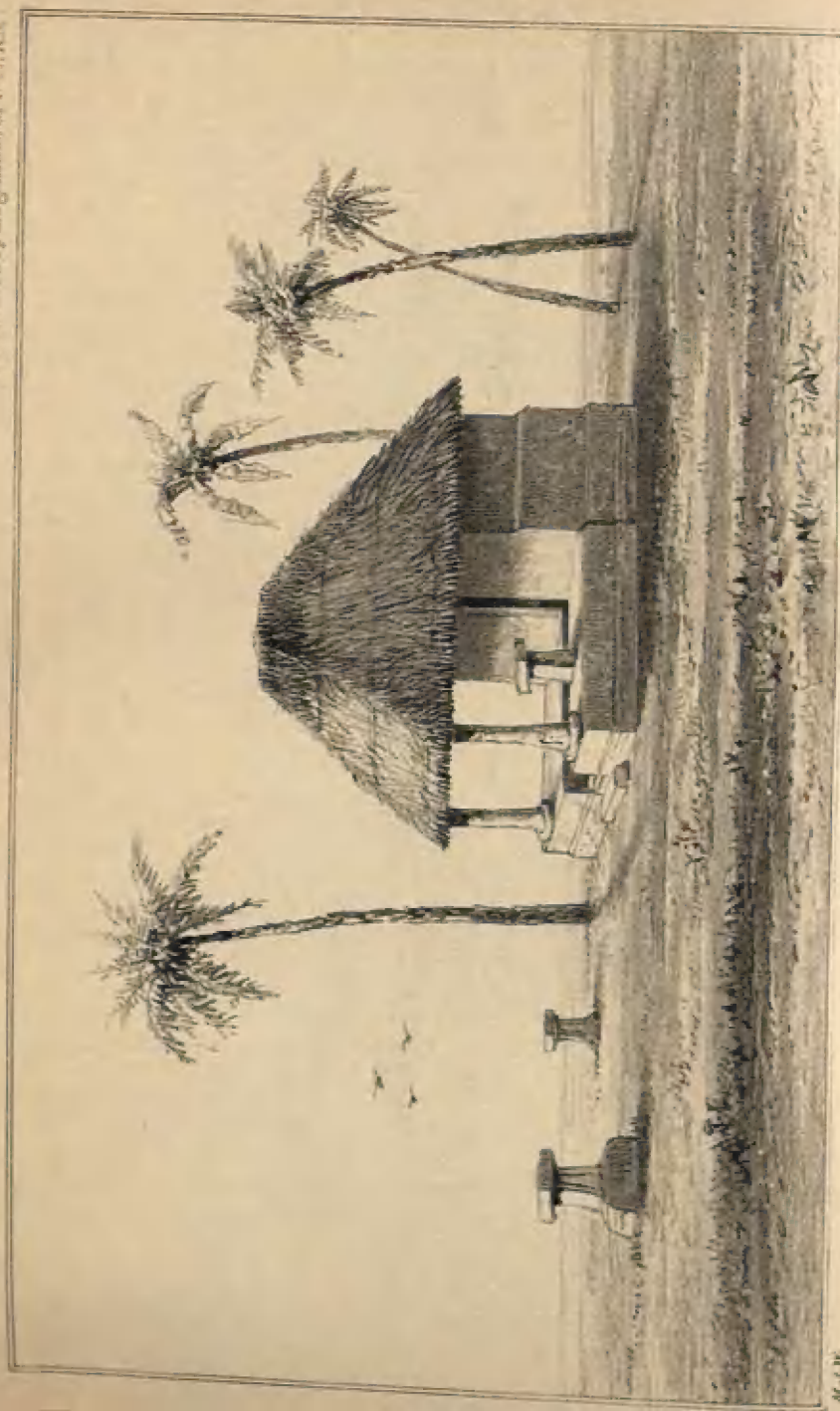
† One Bhūta is specially named Kaluruti, i.e. stone-thrower.

quite unhurt, and safely confined the same day. She said she found herself all at once at the bottom of the well, but could not in the least tell how she came there. The people insisted on showing me the well, which was about 100 yards from the house, large and square, one used for irrigation, but then dry, and from 20 to 25 feet deep. Roman Catholics are very numerous in Canara, but quite as subject to these demoniacal annoyances as the Hindus. One clerk of the Civil Court, a grave, elderly man, affirmed to me that, when passing at evening along a lane near a Bhūtastān, he encountered a dark, monstrous, shadowy shape, which grew larger and larger, on which he uttered some religious verses, when it gradually diminished and disappeared. Another story was the talk of the town, and the parties concerned assured me of its truth. Two high native officials, both Roman Catholics, were sitting at noonday in the verandah of the house of one of them, when ashes and earth came pouring in quantities from the roof. The master of the house exclaimed the Bhūta was repeating his tricks, and, bringing a gun, fired it in the air to frighten the goblin away, when instantly, as if in answer, a quantity of powder was exploded in the midst of the open yard before them, and immediately stones and pebbles were flung by invisible agency towards the house from without. These fell on the verandah, and then, my informant asseverated, went "leaping like frogs" into the house, to the great amusement of the children who had assembled, and who would cry out, "One more!" when another stone would instantly fall and go hopping in! This sort of Bhūta annoyance was declared to be not at all unfrequent. It is curious, anthropologically speaking, to observe how general this strange belief in a grotesque sort of goblin, rejoicing in a particular kind of odd, mischievous pranks, has been in widely separated countries and ages. In China such disturbances are common, and ascribed to "kitchen-gods;" in Arabia and Egypt to the jinnee or genii, who, Mr. Lane says, are believed to throw stones and furniture about in houses. He also relates that pious and learned Muslims, on locking the doors of their houses, storerooms, and apartments when going out, habitually repeat, "In the name of God, the Compassionate, the Merciful," to secure their property during their absence from the mischief and depredations of the Jinn. The Germans have a special name for such spirits, calling them Polter Geist, or racketing-ghost, and the stories about them and their impish persecutions, all much alike, current in Germany, France, and England, are endless. Amongst published accounts it is enough to mention the "Stockwell Ghost," the "Demon of Tedworth," and the extraordinary disturbances at Woodstock, commemorated in Scott's novel. Some years

ago the London papers had accounts of similar mysterious occurrences in a house in Bayswater; and even as far back as A.D. 1188 the "Itinerary through Wales" of Giraldus Cambrensis, translated by Sir Richard Hoare, mentions like stories and manifestations.

Charms or amulets against the evil influence of Bhūtas are—wearing the tooth or nail of a tiger on the neck or near the loins, or an iron ring set with pearls on the finger. In all ages and countries *iron* is sovereign against evil powers. A lime in the turban, or a figure of Hanumān, the monkey-god, engraved on any ornament, are also efficacious, especially on Sundays and Tuesdays. But the most powerful remedy must have been when, in the days of the Rajahs of Coorg, a principality bordering on Canara, it was customary for the Amildars, or native heads of divisions, to issue notices and orders to the Bhūtas, in the name of the Rajah, not to molest any particular individual, to quit any tree they haunted which was required to be felled, and to desist from any particular act or annoyance. It is stated that these behests of the Government were never disobeyed, which, indeed, is not unlikely, as the last Coorg Rajah was not a man who understood being trifled with, either by man or demon. After his deposition, the native officials continued the same style of orders, in the name of the British Government, for some time before the authorities were aware of it!

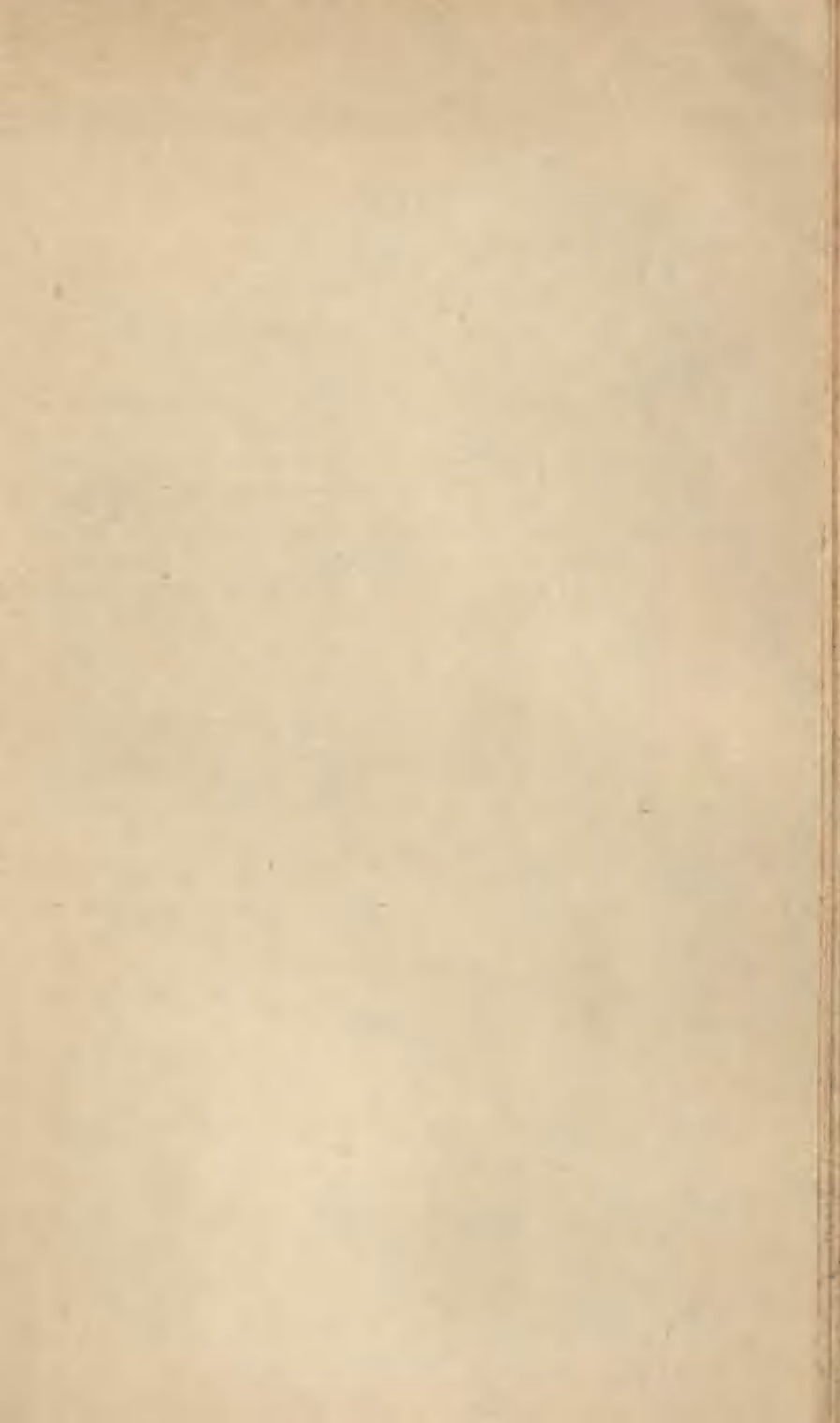
To conclude this subject, the idea is quite familiar that Bhūtas may be perturbed ghosts, "doomed for a certain term to walk the night," but longing to escape from their thralldom and be laid to rest. For the repose of any such unhappy spirit the following ceremony is prescribed:—An image of Vishnu must be engraved on a gold plate, arrayed with a yellow cloth, and washed with water from a holy stream. Around this, placed in the centre, similar images of the other principal gods must be arranged, arrayed and washed in like manner. Then a sacrifice of all manner of perfumes, and quantities of ghee and milk, must be offered, and all the funeral ceremonies in honour of the deceased gone through, and the funeral cakes offered anew in presence of the golden images of the gods. Next a banquet must be given to thirteen pure Brahmans, presenting each with a mattrass, a horse, and a gold pot full of milk. Their united mantrams (*i.e.*, incantations) will then release the soul from its unclean Bhūta state and remit it to salvation. But all this seems a device of later times, invented by the Brahmans to increase their influence and the authority of their gods over the low-caste deities. It would also be a costly ceremony, and I never heard of its having been actually performed.



Pl. XX.

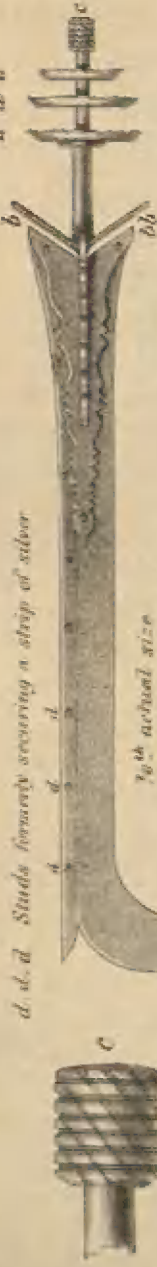
C.F. Kuhl, 1886, London.

BHUTASTAN. IN SOUTH CANARA.





d. d. d. Studs formerly securing a strip of silver



Part of Guard b.



Type Pommel. a. a. a.



EXPLANATION OF PLATES XX. AND XXI.

Plate xx.—Bhūta Temple in S. Canara: from a sketch by Mr. Walhouse.

Plate xxi.—Bhūta sacrificial sword of wrought iron. A narrow plate of silver formerly covered the back, and extended a quarter of an inch on each side of the blade, where it was secured by studs or rivets, composed apparently of an alloy of silver and copper. Ornamental plates on the blade, adjoining the guard, were also, it appears, once covered with silver. The pattern chased on the half-guard, *b*, is drawn with great freedom, whilst the corresponding ornament on the half-guard, *b b*, is regular, and more or less geometrical. In the centre circle there are rectangular rays, alternating with an oval or almond-shaped ornament, the outer band being filled with twelve pelta-like forms. The pommel is peculiar, having three concave guards, and an ornamental termination to the hilt.

DISCUSSION.

Major GODWIN AUSTEN said: Mr. Walhouse's paper is of much interest; it shows how very similar are the forms of demon-worship among the hill-tribes of India. Much that we have heard this evening is common to the tribes of the N.E. frontier, viz. the Gáros, Khásis, Nágás, Duflas, &c. Their demons or spirits are innumerable; every wood, every stream, is the haunt of one, the great point of difference being that, in the N.E. frontier, they are never represented by idols or figures of any kind, nor are temples erected, as it appears is the case in the south-western side of the Indian Peninsula, where Hindu influences have acted on the older forms of religion. The only people who are not demon-worshippers are those of Bhūtan, who Mr. Walhouse has referred to, and seemed to think their name was associated and derived from ghost-worship. In this I do not agree with him. The Bhūtas are Bhudists, and the term "Bhūt," or "Bhot," is applied even to the people of Ladak, and all the intermediate Thibetan people, also Bhuddists, so that I think the word is quite as likely derived from the Hindustani "Bhūdistān," the country of Bhudha or of the Bhūts.

Mr. MOSGRIDGE said: Mention was made of superstitious observances in our own island. I may, therefore, be permitted to bring to your notice a curious custom that not long since was still extant in South Wales and some of the adjoining counties, that of the Sin-eater. More than two centuries ago a well-known writer, Aubrey de Gentilésisme, gives a full account of this observance in Herefordshire, where he was fortunate enough to "interview" the Sin-eater himself. Among the mountains of South Wales I find a similar ceremony prevailing down to almost our own times. When a person died, the Sin-eater of the district was called in. On his arrival he

received a plate, on which he poured some salt. Upon the salt he placed a piece of bread, laid the plate on the chest of the defunct, muttered words of charmed power while bending over the corse, then eat the bread, whereby he eat up and appropriated to himself all the sins of the deceased, received two shillings and sixpence for his services, and quickly retired from the pitying gaze of those present, who regarded him as one utterly and irremediably lost.

Mr. JEREMIAH said: I was very much interested in the paper just read. With reference to the alleged custom of *sin-eating* in Wales, mentioned by Mr. Moggridge, I would remark that the discussion raised by the Rev. D. Silvan Evans in the *Academy* (November 5, 1875) appears to have gone adrift for want of the Welsh word for *Sin-eater*. The discussion arose, as all must be aware, from a statement made by a writer in *Blackwood's Magazine* for last month, in an article on the 'Legend and Folk-lore of North Wales,' where he says, in reference to a funeral custom, that the "Scapegoat . . . is currently called a 'sin-eater.'" Dr. Evans demanded the Welsh equivalent, which the author of that article could not give, in consequence of, he says, "my ignorance of Welsh." (*Academy*, Nov. 27, p. 555.) Had he referred to Bingley's "North Wales," vol. ii. p. 278, he would have seen a way out of his difficulty, and a clear answer to the query put by Dr. Evans; and Mr. Moggridge will also see, I think, that the custom was not known as *sin-eating*, although the original meaning may have been of that nature. Bingley says, "It is usual in several parts of North Wales for the nearest female relation to the deceased, be she widow, mother, sister, or daughter, to pay some poor person of the same sex, and nearly the same age with the deceased, for procuring slips of yew, box, and other ever-greens, to strew over and ornament the grave for some weeks after interment, and in some instances for weeding and adorning it on the eves of Easter, Whitsuntide, and the other great festivals for a year or two afterwards. This gift is called *Dropllys*, and it is made on a plate at the door of the house, where, at the same time, the body is standing on a bier. It had its name from a custom, which is now discontinued (1804), of the female relative giving to the person a piece of cheese with the money stuck in it, some white bread, and afterwards a cup of ale. When this previous ceremony is over, the clergyman, or, in his absence, the parish clerk, repeats the Lord's Prayer, after which they proceed with the body to the church." It appears, then, that the custom means simply a "gift of ale or beer," and not *sin-eating*. Pennant's (in his "Tours in Wales," vol. iii. p. 159, edition 1810) account is slightly different. He says: "Previous to a funeral it was customary, when the corpse was brought out of the house and laid upon the bier, for the next-of-kin, be it widow, mother, sister, or daughter—for it must be a female—to give, over the coffin, a quantity of white loaves in a great dish, and sometimes a cheese with a piece of money stuck in it, to certain poor persons. After

that they presented, in the same manner, a cup of drink, and required the person to drink a little of it *immediately*. When that was done they kneeled down, and the minister, if present, said the Lord's Prayer, after which they proceeded with the corpse, and at every crossway between the house and the church they laid down the bier and knelt, and again repeated the Lord's Prayer, and did the same when they first entered the churchyard." This custom, and that of the alleged sin-eating, are conclusively one and the same, viz. that of DIODLYS.

Mr. EDKINS and the PRESIDENT also made a few remarks.

Portions of a skeleton found in a stone coffin, 11 feet below the surface, in Bishopsgate-street, were exhibited by Mr. John Staples.

Mr. HOOPER MAY exhibited and presented a skull found at Fulbourn under the following circumstances:—

In making a cutting through some rising ground, about half a mile on the Cambridge side of the Fulbourn Station of the Newmarket and Bury Railway, the workmen came upon three pits or wells sunk in the chalk. These pits were about three feet from each other, and were situated upon the summit of the low hill through which the cutting was made. The largest of them—that next the Fulbourn Station—was a circular shaft sunk for about ten feet in the chalk. It was carefully built up. The inner surface was smooth, and coated with a layer of hard cement, about three inches thick. Then came an outer and thicker layer of coarse concrete, about ten inches thick, which was reddened by the action of fire. At about six feet from the top, the shaft was abruptly reduced in diameter from nine feet three inches to six feet three inches, leaving a set-off or ledge twenty inches wide, and was carried down to a further depth of nearly four feet in the chalk. The inner surface of this lower and smaller portion was blackened, as if by the combustion of wood and other vegetable substances, and contained masses of black carbonaceous matter. The workmen stated that at the junction of the sides with the floor they found some slabs, placed obliquely, so as to construct a sort of flue for draught, but of this there were no traces. The upper and larger portion of the pit was filled partly by the surface soil, below which was a thick layer, two or three feet thick, of a very soft calcareous deposit, which the workmen called "butter," composed of slaked lime, containing a considerable quantity of water. By exposure to the air it became quite dry and hard. Below and by the side of this soft layer of lime was a layer of vesicular, spongy, calcareous matter, very light, and composed of pure chalk—carbonate of lime. It has not at all the appearance of having been produced by burning. At the

point of junction of the wide and narrow portions of the shaft was a round-headed opening, which led into a second excavation by a short passage about two feet six inches long. This second pit was simply sunk in the hard chalk, and was not built up after the fashion of the first pit, by boundary walls of concrete and cement. It was of equal diameter throughout its whole depth, and not narrowed at the lower portion. The sides of the opening communicating with the first were burnt and reddened. The side of the shaft, opposite the aperture from the first pit, was perforated by another similar opening, cut through the chalk, which led into a third excavation. This has been only partially cleared out; it appears to be not a circular shaft, but a cutting with parallel sides, the floor of which inclines upwards. As to the purpose for which these pits were constructed:—It is quite evident that the largest and deepest of them was used as a kiln of some kind—it could scarcely have been for burning bricks or pottery—nor was there the slightest evidence that it was used for cremation. The occurrence of a considerable quantity of slaked lime seems to prove positively that it has been a lime kiln. There is no very positive evidence as to the date of the construction of these works, but so far as an opinion can be formed by the objects found in the surface soil by which these pits were partially filled, they may be regarded as Roman. The soil which filled the upper portion of the excavations contained broken pottery, both red and black ware of Roman date, and also human and other bones—ox, horse, and a horned sheep. A good many human skeletons, perhaps as many as thirty, were discovered in making the cutting between the Fulbourn Station and the site of the excavation—about half a mile. The soil also contained abundant fragments of pottery and bones of animals. The bones have evidently been long buried, and as is usual, the crowns of the teeth in the skulls are worn very smooth.

A paper by Mr. BERTRAM HARTSHORNE, on the "Weddas of Ceylon," was read.*

The meeting then separated.

DECEMBER 28th, 1875.

Colonel A. LANE FOX, President, *in the Chair.*

The minutes of the previous meeting were read and confirmed.

The following new members were announced:—Major H. H. GODWIN AUSTEN, Chitworth Manor, Guildford; Mrs. T. COWIE,

* This paper has been since printed in a London magazine.

12, Southwell Gardens, Kensington; A. L. LEWIS, Esq., 151, Church Road, Essex Road, N.; and ERNEST WILLETT, Esq., 33, Buckingham Place, Brighton.

The following papers were read by their respective authors :—

NOTE on a PROPOSED INTERNATIONAL CODE of SYMBOLS for use on ARCHEOLOGICAL MAPS. By JOHN EVANS, F.R.S.

At the Congress of Prehistoric Archaeology and Anthropology, held at Bologna, in the year 1871, the late Count A. Przezdziecki brought the subject of adopting some international code of symbols for denoting the various kinds of prehistoric relics upon archaeological maps before the meeting, and a committee was appointed to report upon it. The matter had already been, to some extent, discussed by the archaeological section of the Literary and Scientific Society of Cracow, and their report will be found at p. 364 of the Bologna volume of the Congress. Owing to the untimely death of Count Przezdziecki, the committee of 1871 does not appear to have met, and the subject was again brought forward at the Stockholm Congress of last year in an able paper by Mons. Ernest Chantre.

A second committee was then appointed, consisting of Messrs. Capellini, Desor, E. Dupont, Engelhardt, John Evans, Hans Hildebrand, Leemans, Lerch, de Mortillet, Romer, and Virchow, representing the following countries :—Italy, Switzerland, Belgium, Denmark, Great Britain, Sweden, Holland, Russia, France, Austria, and Germany. The committee held a meeting in Stockholm, when the question was fully discussed, and it was resolved to add M. Chantre to its number, and to constitute him and M. Gabriel de Mortillet a sub-committee, to settle the details of the scheme, after taking into consideration such written statements as any members of the committee might address to them. Such communications were made by Messrs. Engelhardt, Evans, Leemans, Lerch, and Romer, as also by M. Dupont, who forwarded a note from M. Van der Maelen, the author of the Archaeological Map of Belgium.

The report of the sub-committee has just been completed, and I take this opportunity of bringing its contents before the anthropologists of this country.

It is divided under three heads: the maps, the signs, and the colours to be employed. The general instructions are good, as to the maps illustrative of prehistoric archaeology being on a moderate scale, not too full of topographical details, unless faintly engraved, but yet giving the principal roads, and sufficient indications for finding the monuments designated. It is,










however, with the second part of the subject that we are most concerned. It is pointed out that in order to be generally adopted the symbols should be—

1. *Simple*, easily drawn, and readily visible.
2. *Well defined*, and distinct the one from the others.
3. *Special*, that is to say, not already appropriated as conventional signs on common maps. For this reason a circle is inadmissible.
4. *Universal* in their application, and bearing no relation to the language of any particular country.
5. *Mnemonic*, so that their forms call to mind the objects they represent.
6. *Susceptible of multiplication*, so that they may form a sort of alphabet with which, as occasion may arise, to create new words. With this view the symbols are treated under three heads as *radical*, *derivative*, and *complementary*.

RADICAL SYMBOLS.

These are simple in character, but sufficient to denote the principal objects of prehistoric archaeology on a map, and are susceptible of slight modifications and combinations, for the purpose of giving further details or meeting fresh cases.

They are nine in number.

| | | |
|---|-------|---|
| 1. Cavern, underground dwelling, rock shelter | .. |  |
| 2. Menhir, standing stone, monolith | |  |
| 3. Dolmen, allée couverte | |  |
| 4. Tumulus, barrow | |  |
| 5. Interment, human bones | |  |
| 6. Camp, oppidum, entrenchment | |  |
| 7. Lake-dwelling, pile-building | |  |
| 8. Find, station, dwelling (foyer) | |  |
| 9. Mine, quarry, excavation | |  |

It will be seen at a glance that these signs fulfil all the principal conditions of the case, being both simple and distinct.






The slight resemblances between those for cavern and tumulus, menhir and find, dolmen and lake-dwelling, are unimportant, and the differences between the symbols is readily recognized.

The whole of the nine are also special, and such as do not occur on ordinary maps, while they are sufficiently mnemonic to remind one of the objects they are intended to designate. That they are susceptible of multiplication will be evident when we come to consider their derivatives. In their simple condition they will suffice for maps on a small scale. Where greater detail is required, slight modifications and simple combinations will serve to convey a great amount of information.

DERIVED SYMBOLS.




1. *Radical,—Cavern.*





Caverns and underground dwellings may be either natural or artificial. For those excavated by the hand of man the symbol may be used in its simple form, open; and for natural caverns, which are usually much larger and darker, with the hollow closed. The following derivatives are suggested:—

| | | | | |
|---------------------------------|----|----|----|---|
| Artificial underground dwelling | .. | .. | .. |  |
| Natural cavern or rock-shelter | .. | .. | .. |  |
| Artificial cavern, sepulchral | .. | .. | .. |  |
| Natural cavern, sepulchral | .. | .. | .. |  |
| Cavern used as a refuge | .. | .. | .. |  |

These are formed, as will at once be seen, by the addition of the symbol for interment, or of entrenchment or oppidum, to the radical cavern.




2. *Radical,—Menhir.*

| | | | | |
|---------------------------------|----|----|----|---|
| Veritable menhir or monolith | .. | .. | .. |  |
| Alignment, or series of menhirs | .. | .. | .. |  |
| Cromlech or stone-circle | .. | .. | .. |  |

| | |
|---|---|
| Rocking-stone, |  |
| Cup-marked stone |  |
| Stone with inscription or sculpture |  |
| Legendary stone |  |






The alignment is symbolized by the two lines at the base; the cromlech, or stone-circle, by the semicircle of dots; the slanting transverse bar signifies a rocking-stone; the dot on the centre of the symbol a cup-marking. A thick, square base to the symbol typifies sculpture, and the obscurity which usually attaches to stones of legendary fame is characterized by darkening the sign.


3. *Radical.—Dolmen:*


| | |
|---------------------------------------|---|
| Dolmen, passage-grave, &c. |  |
| Dolmen covered by a tumulus |  |
| Dolmen on a tumulus |  |

These symbols would presumably refer to the existing state of the monuments.

4. *Radical.—Tumulus.*


| | |
|---|---|
| Simple tumulus or mound |  |
| Sepulchral barrow |  |
| Entrenched barrow |  |
| Long barrow |  |
| Barrow with wooden cist or coffin |  |

Tumulus with statues 

Pits or depressions (Mardelles) 

Some of these symbols, such as that for a barrow surmounted by rude statues, would probably not be required in Britain.

5. Radical.—Interment.

Simple interment, or accidental burial 



Interment by inhumation 

Interment after incineration 

Cemetery of unburnt bodies 


Cemetery of burnt bodies 


To these I would venture to add—

Interment in a contracted position  reserving the symbol  for extended burials.

Some other combinations of this symbol have already been noticed. The mark of a cemetery is made by the addition of the sign *plus* +.

6. Radical.—Camp.


Camp, entrenchment, fortification, &c. 

Associated with a barrow or mound 







Dykes, lines of defence, &c. 


This sign is intended to represent all places of refuge or defence, whether wholly or partially surrounded by earth-works. Its combination with the symbol for cavern has already been noticed.

7. Radical.—Pile-building, or Lake-dwelling.


This symbol  represents all such monuments, whether lake-dwellings, pile-works, or crannoges.

8. *Radical.—Find or Discovery.*

| | |
|---|---|
| Of an isolated object |  |
| Of several objects together |  |
| Workshop or foundry |  |
| Station or site of human occupation |  |
| Kjökkenmödding |  |
| Terra-mara |  |

The simple  symbol is conventional rather than mnemonic. Its combinations or derivatives are, however, intended to symbolize their meaning. The discovery of several objects is indicated by doubling the sign, and this for workshops or foundries is darkened. The mark for a station approaches that for a town on ordinary maps. The mound of a kjökkenmödding and the pit of a terra-mara are indicated by the grouping of the three triangles, of which two are in the one case white and in the other dark.

9. *Radical.—Mine or Excavation.*

This sign  requires no derivatives. It is suggested that it might be of service as indicating the sources from which materials found at any given spot were derived. In the case of a dolmen, for instance, in which the stones had been brought from a distance, the symbol for mine might be placed at the nearest or most likely spot from which they were brought, and connected with the sign of the dolmen by a dotted line showing the relation of the two signs.

Complementary Symbols.

These are of a simple character, and intended to complete, so far as possible, the archaeological indications on a map. They come under three categories, and relate to the condition, the number, and the age of the monuments.

Category 1.—Symbols relating to the condition of monuments. These are four in number:

1. A small circle under the symbol, to denote that they have been investigated.

2. A transverse line across the symbol, to signify that the monuments are dilapidated or in bad condition.

3. Two lines crossing each other so as to cancel the symbol. These denote that the monuments have been entirely destroyed and have disappeared.

4. A small bar, like a bend-sinister, at the side of the symbol, to denote that the monuments are false, or have been wrongly indicated or determined.

| | | | Explored. | Dilapidated. | Destroyed. | Spurious. |
|----------------------------|----|----|-----------|--------------|------------|-----------|
| Cavern | .. | .. | | | | |
| Artificial cavern | .. | | | | | |
| Menhir | .. | .. | | | | |
| Dolmen | .. | .. | | | | |
| Tumulus | .. | .. | | | | |
| Cemetery of unburnt bodies | .. | .. | | | | |
| Entrenchment | .. | | | | | |
| Pile-building | .. | | | | | |
| Terra-mara | .. | .. | | | | |

Category 2.—Symbols having reference to number.—These are simple adjuncts placed above the principal symbol to the right. Where the exact number is known this may be indicated by a numeral; where it is unknown, but several monuments exist, it is indicated by the sign *plus* +; where the number is large this sign may be doubled. As, for example—













| | | Several. | Many. | A specified number. |
|-----------------------------|----|----------|-------|---------------------|
| Artificial sepulchral caves | | | | |
| Depressions | .. | | | |
| Burnt bodies | .. | | | |

Category 3.—Symbols relating to the age of the monuments. —The different ages may be distinguished by printing in different colours, as will be subsequently explained. On the ground of expense, however, or for other reasons, it may be desirable to print them simply in black. In this case, the following signs are to be adopted :—

| | | | | | | |
|--------------------|----|----|----|----|----|----|
| Palæolithic period | .. | .. | .. | .. | .. | ↑ |
| Neolithic period | .. | .. | .. | .. | .. | ↑↑ |
| Bronze period | .. | .. | .. | .. | .. | × |
| Iron period | .. | .. | .. | .. | .. | ⚔ |

As a guide to memory, it may be observed that the symbol for the earliest period is the most simple, and that for the latest the most complicated. One or more such marks may be attached to each radical or derivative symbol. For instance, a cavern in which relics of the palæolithic, neolithic, and bronze ages had been found, might have superadded to the radical symbol, lines with the single barb, the double barb, and the saltire attached.

Examples.

| | | | Palæolithic. | Neolithic. | Bronze. | Iron. |
|-----------|----|----|---|---|---|---|
| Cavern | .. | .. |  |  |  |  |
| Discovery | .. | .. |  |  |  |  |
| Station | .. | .. |  |  |  |  |

When the age is doubtful, a note of interrogation may be added.

Colours.

The use of complementary symbols to indicate the age of monuments, though simple and easy, has the disadvantage of complicating the principal signs, and of overcharging the maps with hieroglyphics. It is therefore better, where possible, to employ colours, as originally recommended by M. Chantre. Colours have also the advantage of rendering all the monuments of one age visible together at the first glance at a map. After carefully examining the advantages and drawbacks attaching to

various tints, the authors of the report recommend the adoption of the following:—

| | | | |
|-----------------|----|----|------------------|
| Palæolithic age | .. | .. | Brownish yellow. |
| Neolithic age | .. | .. | Green. |
| Bronze age | .. | .. | Red. |
| Iron age | .. | .. | Blue. |

The green and the blue should be such as cannot be confounded with one another when seen by artificial light.

It is mentioned that the colours blue and red were assigned long ago by the Egyptians to the metals iron and bronze, weapons of these metals being painted in these colours by Egyptian artists. As to the colours for the two ages of stone, the ochreous tint of many palæolithic implements, and the green jade of which some of the finest polished celts are fashioned, may assist in recalling them to mind.

Such, in brief, is the report of Messrs. Gabriel de Mortillet and Ernest Chantre, and there can, I think, be but little doubt that the code of symbols recommended by the committee, of which they are the representatives, will be largely adopted on the Continent in maps illustrative of prehistoric archaeology. They are brought under the notice of those who in this country are interested in prehistoric questions, in the hope—1st, that when any maps are prepared on which the use of such symbols is desirable, it may not be forgotten that a carefully prepared code is already in existence; and, 2nd, that those to whom we are indebted for so large an amount of trouble bestowed on its preparation may meet with some reward in seeing their labours bear fruit in this as well as the other civilized countries of the world.


DISCUSSION.

MR. FRANKS took the opportunity of stating that, as reference had been made to the Prehistoric Congress at Stockholm in 1874, he regretted to have to inform the Institute that he had just heard from Stockholm that the volume of Transactions of the Congress, of which 832 pages were in type, had been totally destroyed by a fire at the printers. The reprinting is to be immediately commenced, and will, it is hoped, be completed by May next.

THE PRESIDENT thought that, upon the whole, the proposed code of symbols combined simplicity with clearness as well as any that could be suggested, and he hoped they would be adopted. There were some slight omissions, however, which might be easily remedied. For example, there was no radical sign for the important class of prehistoric habitations. The sign for "find" or for prehistoric "station" did not necessarily imply that the remains of dwellings were to be found there. The following symbols, he thought,

would meet the case without interfering with those given in Mr. Evans's paper, viz. :—

| | | | | | | |
|------------------------------------|---|---|-----|-----|-----|---|
| Prehistoric dwelling or chamber | { | above ground | ... | ... | ... | ⏏ |
| | | half underground, or pits | ... | ... | ... | ⏏ |
| | | underground chamber or artificial cave | ... | ... | ... | ⏏ |

Then, again, although there was a radical for a defensive work, there was none for earthworks of a non-defensive character, which were common in all parts of the world. He thought that the annexed symbol might be employed in conjunction with any other symbol to denote that a work was defensive ; whilst the

symbol employed in the paper for "camp or defensive work" might be used merely to designate "earthwork." If the code obliged us to mark all earthworks as defensive it would lead to error.

Mr. EVANS, in reply, observed that one of the features of the proposed system of symbols was, that it gave a series of radical signs which were susceptible of modification to meet any special cases. No doubt any map on which the symbols were adopted would have some index appended, in which any special modifications would be explained. In the short paper which he had read he had not entered so fully into detail as did the original report in French, a copy of which he begged leave to present to the Institute.

RHABDOMANCY and BELOMANCY, or DIVINATION by the ROD and by the ARROW. By A. W. BUCKLAND, M.A.I.

It cannot, I think, be denied that divination in some form has been practised by every nation, civilised and uncivilised, with which we are acquainted. It doubtless had its origin in the world's infancy, when men began to see in natural objects things incomprehensible, and were led by dreams and visions to a belief in the supernatural, and by a further step in the same direction, to associate the spirits of the departed with things animate and inanimate. Hence arose an elaborate system, divided into numerous branches requiring as its exponents trained men skilled in the deep mysteries of nature, and admitted to a knowledge of those dexterous juggleries whereby natural phenomena were made to assume awful and threatening aspects in the eyes of the ignorant and superstitious multitude, in order the more securely to maintain that authority obtained by a reputation for supernatural power. Thus the magicians of Egypt, the astrologers of Chaldea, the magi of Persia, the augurs of Etruria, Greece, and Rome, the Druids of Gaul and Britain, all diviners, exercised probably more real power than the kings and chiefs of their respective countries, who were

commonly only the ministers of the will of the gods as interpreted by their priests.



To treat of divination as a whole in a single paper would be obviously impossible; for it will be observed that almost every nation adopted some special mode of divination as peculiarly sacred, not, however, to the entire exclusion of others, which may have represented the superstitions of an earlier aboriginal population. I have, therefore, selected for investigation two branches of this wide subject, believing that in their extensive range and singular affinities will be found interesting matter for anthropological inquiry, whilst the survival of one of them in our own country to the present day is a curious instance of the durability of superstitions, notwithstanding the advance of education and civilisation; nor will the portion of our land in which this relic of the bygone faith of ancient days yet lingers be deemed wholly devoid of significance by ethnologists.

Among the Mendip Hills, in the old mining districts of Cornwall, and, I believe, also in Derbyshire, Rhabdomancy pure and simple still exists and flourishes. About two years ago I witnessed the performance of an expert who had been summoned from the Mendips, at considerable expense, to find a spring of water in a garden, about three miles from Bath, by means of the divining-rod. Cutting a forked branch from a green tree, and holding one end of the fork in each hand, he walked over the ground, holding the stick before him, the ends pointing towards the earth; but when he arrived at a spot where, as he said, water might be found, the stick raised itself and turned over in his hand with such force as sometimes to break itself. A well was dug on the spot where these indications were the most marked, and I need not say that water was found, although not in the abundance which the violent behaviour of the rod would seem to have promised. The diviner, or *dowsers*, assured me that not one in a thousand had the power of thus using the rod, and I certainly tried it myself in vain; but whether there is in reality some mysterious force in certain persons communicated through the hands to that which is held in them, or whether the effect is produced by dexterous manipulation, I must leave others to judge. Reports have from time to time been given of certain persons who have performed wonders by this mysterious power. Lady Milbanke is said to have convinced a Dr. Hulton, who had written a pamphlet against the superstitious practice, by discovering a spring of water in his own garden by the rod. There can be no doubt of the belief of the Cornish and Mendip miners in its power. Mention is made in Migne's Dictionary ("Sciences Occultes") of a young man who found gold hidden in the earth by a violent emotion

which he experienced when walking over it; and Dr. Carpenter mentioned to me the case of a youth who seemed to be similarly endowed, but who failed to discover a mass of plate hidden in a field with great precautions, as a test. The conclusions, therefore, of this astute observer are, that where every kind of suggestion has been rigidly excluded, the failure has been complete; and that the instances of success are to be accounted for (where no fraud was practised) by guesses on the part of the performers themselves, or by the unintentional promptings they have received from the bystanders who are in the secret. And he seems to incline to the belief of the French *savans*, that the movement in the rod is due to the tension of the muscles held long in one position, resulting in involuntary motion.* But in the instance I have recorded, the stick had certainly not been cut from the tree five minutes, nor held in the hand one, when the movement was produced, either by some act of jugglery, or by some mysterious force at present unexplained. The "expectant attention of the performer" was recognised by MM. C. Nevreuil and Biot as the cause of the movement. Some pretenders to the art, as the notorious Jacques Aylmar (1692) have been proved to have been impostors, but for particulars of these I must refer the curious to the pages of *Notes and Queries*, to the works of Pierre Lebrun, Baring Gould, and others, my object in this paper being not so much to analyse the possibility of the alleged power as to trace the origin of a wide-spread belief. All writers who have treated of rhabdomaney, or divination by the rod, are united in assigning to it a very high antiquity; they generally trace its origin to the Scythians, and say that from them it passed into Assyria, Palestine, Greece, Etruria, Rome, and, by another route, through Russia and Germany to England. They identify the divining-rod with the miracle-working rod of Moses and Aaron, the Caduceus of Mercury, the wand of Circe, and other magicians; and the lituus of Romulus and Numa Pompilius, and in all the wonders related of it may be traced some connection with one or other of these famous miracle-working wands; for the divining-rod was employed not only to discover water-springs and metals, but also to mark out boundaries, to discover corpses, and to bring to justice murderers and thieves. In the discovery of water, its affinity was with the rod of Moses, who, by striking the rock with the rod, caused water to gush forth. But the remaining qualities assigned to it seem to have more especial reference to the Caduceus of Mercury, which was the golden rod of wealth, and was used to conduct souls to Hades,

* See Article "What to Believe," by Dr. Carpenter, *Quarterly Review*, vol. xciii. p. 601. 1863.

whilst Mercury, in his character of Hermes, was especially the god of boundaries and of thieves, having himself been a thief, even from the day of his birth, when he rose from his cradle to steal the cattle of Apollo. In the power assigned to the divining-rod of tracing boundaries, we see its affinity not only with the rod of Mercury, and that of the older Egyptian Thoth or Hermes, who taught the Egyptians to measure their fields, but also with the lituus of Romulus, used by him to mark out the various regions of Rome, and which was afterwards laid up in the temple of Mars as a most precious relic. "Plutarch says that Romulus was very religious and very clever in divination, and for this purpose made use of a lituus, which is a bent stick."^{*}

It may be supposed that with the numerous properties assigned to the divining-rod different forms and different substances would be employed in its manufacture. Thus we find that although the most general form was that of the letter Y, with the lower limb more or less elongated, the reason assigned for the use of this form being, that it is supposed that the hands convey some virtue to the rod; yet sometimes a straight stick was employed, or one cut straight in the centre with a branch at each end, , and sometimes the forked branch was cut close to the fork, , whilst frequently several rods were used together. Hazel was the wood generally most esteemed, but the almond, the willow, the ash, or some fruit-bearing tree had each many advocates. Some argued that in searching for metals rods of metal should be used, or that, at least, the wooden rod should be tipped with metal, and it was commonly believed that it would only turn for that particular object in the search for which it was employed, to ensure which result it should be first touched with that substance which it was expected to discover. In using them sometimes a prayer was said, or sometimes a cross was engraved on the rod. Lebrun† describes four old divining-rods found in Paris, on which were inscribed the names of the three Magi, Baltazar, Gaspar, and Melchior. In the laws of the Frisians, after their conversion to Christianity, permission was given to use divining-rods in proving homicide, and the ceremony was performed in church before the altar. Two twigs, one marked with the sign of the cross, were covered with clean wool and laid upon the altar or the holy relics, and a prayer made that God would, by a sign, discover the guilty.‡

In considering the origin of the supernatural qualities assigned to the divining-rod, we cannot fail to observe its obvious connection with the use of a rod or staff, either plain or variously

^{*} Lebrun, Tom. ii. p. 394.

[†] Lebrun, Tom. ii. Book 7, p. 636.

[‡] "Archæologia," vol. xlii.

ornamented, in all ages and in all countries as a symbol of authority. The sceptre of modern monarchs has its prototypes in ancient Egypt, in Peru, and even among the relics of the unknown prehistoric cave-dwellers of France and Britain; for archaeologists believe that the stag's antlers perforated with one or more holes, and often engraved with various figures, which are sometimes found in the caves explored, are the sceptres or wands of office of those primitive people; and it seems to me not altogether improbable that the branching horns of the stag, used in former times as a token of the power possessed by the chief of a tribe, may have suggested the form of the divining-rod. Certain it is that horns of various kinds were used in the very earliest times to symbolise power, and hence were frequently chosen to adorn the heads of gods. The figure most suggestive of the use of the horn as a symbol of dignity in Gaul and Britain is that dug up, I believe, in Paris, and engraved in the "*Pictorial History of England*." It represents a robed man, the head adorned with horns, which may be either single-branched stag's horns or forked sticks, and beneath is the inscription, "*Cernunnos*." The peculiarity in this figure is that the horns have upon them several rings strung upon a larger one. Now we are told by Philostratus* that "the Indian Brahmins carry a staff and a ring, by means of which they are able to do almost anything." The images of Vishnu commonly represent him as twirling a ring on the finger of one hand, whilst on the cylinders of Babylon the forked and branched wands borne by priests or monarchs are frequently adorned with rings. In all magical ceremonies the first step was to draw a circle with the magic wand. The Assyrian goddess Hera, figured by Layard, bears in one hand a rod surmounted by a circle, and in the other one with a crescent; and it is a curious coincidence that in the rock sculptures of Peru, as given in Hutchinson's work, a human figure appears bearing a rod to the end of which a ring is attached, whilst another rod of the form of a bifurcated stick, is represented on the same rock, having a bird perched upon it, thus evidently connecting it with augury. "The bifurcated stick," says Tyndale,† in his book on Sardinia, "must have been an important symbol, it appears in Etruscan tombs and on Babylonian cylinders." "In the coins of Cyprus the columns of the temple of Venus are represented with bifurcated capitals, and the Pythagorean V, the symbol and emblem of human life, might perhaps also be considered an analogous character." To these may certainly be added the standards of the ancient Egyptians, as given by

* "*History of Magic*," p. 210.† Tyndale's "*Sardinia*."

Wilkinson (vol. i. p. 294), upon which the same form of the branched or bifurcated stick appears; indeed, the rods borne by Egyptian gods or priests are almost always forked at the lower end, whilst they bear on the top either a lotus-flower or the head of some sacred animal, most commonly that of the sacred jackal, and it is worthy of remark that the same animal was also sacred in Mexico, where it has been found buried with care.*

If we turn to the representations of the divinities of Greece and Rome we find them all bearing rods typical of their several attributes, and amongst them the ring and staff and the bifurcated stick are conspicuous, that which I take to be an early form of the Caduceus, given in Smith's Dictionary as from a painted vase, represents these two forms combined, whilst in that assigned to Pluto the origin from the head and horns of an animal may readily be traced. Two singular survivals, illustrating the use of a forked stick in divination and lots, and connecting it also with that which, I believe, to be the earlier form, that of the horn, and also with augury by birds, may here be noted. The first is, the use still made by young people of the merrythought or wishing-bone of a fowl, the form of which is that of the divining-rod and also of the branching horns of the stag; this, pulled asunder, denotes good luck to the one in whose hand the larger portion remains, and being again drawn as a lot, gives a wish to the fortunate drawer of the lucky portion, the belief in the peculiar luckiness of this bone being evidently derived from the ancient use of the cock in divination. The second survival I would notice is the use of the first and fourth fingers of the hand, extended so as to form a figure strongly resembling the rod of Pluto, as a charm against the evil eye. I do not know whether this form, which is called "making horns," is still employed in England, but it is commonly used in Italy, and considered so potent a charm that it is made by stealth whenever the Pope passes, who is believed to be possessed of the evil eye.

The form of the rods of Moses and Aaron are not defined, but from the budding of the latter, it was probably a branched stick of almond. There is a passage in Hosea (iv. 12), "My people ask counsel at their stocks and their staff declareth unto them," which is given by Jerome, Cyril, and other commentators, as well as the Septuagint, as referring to Rhabdomancy among the Hebrews, who are said to have learnt the art in Babylon; and it is suggested that perhaps at the same time

they consulted both the rod and an idol, the figure of some god being engraved on the rod.*

The use of divers rods in divination would soon cause them to be regarded as possessed of inherent power, hence we find innumerable instances given of miracles wrought by the rod. It is evident that some veneration existed in the mind of Moses for the rod which became a serpent, and wherewith he smote the rock; and that of Aaron, which budded and produced almonds, was laid up in the ark with superstitious reverence. When Elisha was applied to for the restoration of the dead son of the Shunamite, he sent Gehazi to lay his staff upon the child's face, as though in that resided life-giving power, and this belief in its miraculous and curative properties extended to mediæval times. In Lebrun's "*Histoire des pratiques superstitieuses*," page 367, we find "Borel relates of the physician Laigneau, that he made use of no other remedy than a rod of hazel to cure broken bones; he cut little hazel wands when the sun entered the sign of the Ram, and having sealed the two ends to keep in the virtue, he only rubbed the contusions with one of these rods and the bones were restored to their places as if by enchantment. The same doctor also prepared rods of ash at the conjunction of the sun and moon in the sign Aries, and by a touch with them cured hæmorrhages." Lenormant† points out the extreme development of this superstition among the Fins; thus, "Whatever might be the power of those enchantments which controlled nature and supernatural beings, spirits, and gods, there is a talisman still more powerful, for it arrests their effect, and protects from it those who possess it; it is the 'celestial rod' (*bâton céleste*), analogous to the divining-rod of the Magi of Media. The gods themselves can only be secured against certain enchantments by virtue of this rod. Wainämöinea, menaced by the chief sorcerer of Lapland, replies to him, 'The Lapp cannot injure me by his enchantments, for I have in my hand the celestial wand, and he who hates me, he who creates mischief, does not possess it.'" When the magician traced with his wand a circle on the ground, as was commonly done in all magical ceremonies, it was doubtless to signify the power he possessed by virtue of the rod over the god supplicated. Hence the circle, which everywhere represented the sun, became united with the rod to form a magical symbol, and the same was the

* Bancroft says:—"The merchants of Mexico had a god called *Zencatecutli*, the god who guides. The principal image of this god was the figure of a man walking with a staff. Practically, however, every merchant revered his own staff as the representative or symbol of this god." "*Native Races of the Pacific*," vol. iii. p. 416.

† "*Les Sciences Occultes, en Asie*." Lenormant, p. 221.

case with the crescent, signifying the moon, represented in its earlier form by the bifurcated stick; thus when we find these figures carried out in stone circles, grave-mounds, and tumuli, as notably at Stonehenge, and among the Sepulture dei Giganti in Sardinia, we may reasonably assume them to have been created by the worshippers of those gods whose symbols they represent.

Veneration for the rod would naturally lead to the same feeling for the tree which produced it, hence in almost all civilised lands we have legends of trees to which miraculous virtues are ascribed. The oaks of Dodona and of the Druids, the ash of Scandinavia, America, and Britain, the fig tree of India, are examples of this; but there is something unexplained in the peculiar power ascribed to the hazel, from which preferably magicians' wands were made. This is supposed by some to arise from its faint resemblance to the almond, from which the rod of Aaron was taken, or according to others, because it was the wood used by Moses to sweeten the waters of Marah; but that a peculiar sanctity was attached to the hazel and its fruit, in lands where Moses and Aaron were quite unknown, and long prior to the introduction of any Jewish or Christian tradition, is evident from the frequent discovery of hazel-nuts in prehistoric graves, not only in this country but even in Peru.*

Lebrun gives the following prayer or incantation, used at the cutting of divining-rods, which certainly savours strongly of worship:—"Hazel, I break thee, and conjure thee, by the virtue of the Most High God, to show me where may be found gold, silver, or precious stones. I conjure thee to show me that thou hast as much virtue as the rod of Moses, which he made into a serpent. I conjure thee to show me that thou hast as much power as that of Aaron when he led the children of Israel across the Red Sea. Thus I break thee, hazel, at this time, in order that thou mayest discover to me that which is hidden, in the name of God," &c.† Although the almond furnished the rod of Aaron, that of Moses, called the rod of the prophets, was cut, we are told by Adam, from a myrtle of Paradise, and was given to him by Shoaib, the father of Zipporah, to whom it had descended, in order to drive away the wild beasts from his flocks.

Belomancy, or divination by arrows, existed side by side with rhabdomaney in many countries, and has often been confounded with it. In fact, they seem to be very closely connected, the history of their origin being almost identical, for whilst the divining-rod is traced to the golden rod given to

* See Hutchinson's "Two Years in Peru."

† Sale's "Koran," cap. 28, p. 319 (*note*).

Mercury by Apollo, the divining-arrow, which was also of gold, was given by Apollo to a mythical personage named Abaris, who is said to have come from the land of the Hyperboreans to Greece in the time of Pythagoras, in consequence of a terrible pestilence, which could only be remedied by offerings to Apollo made in Athens for all nations. Abaris, the Hyperborean, was the ambassador from his own country, and he then received from the god this magic arrow. By means of this arrow Abaris could transport himself instantaneously over land and sea as on a horse. Mercury is also said to have used the Caduceus in this manner, so that it may well be that Abaris is but a later form of Mercury, and that in the rod of the one and the arrow of the other we see the origin of the witch's broomstick. It is, at all events, matter of history that arrows marked with certain signs were used in divination among the Scythians, Chaldeans, Arabs, and, Tacitus ("Germ." 10) says, among the Germans also. In a book recently published* we find the superstition embedded in a tale which is said to be widely current in the east of Europe, and exists also in the collection of stories of the Turkish races in South Siberia, edited by Radloff. According to this tale, "when the hero, who has descended into the lower world, and has been left there by his faithless companions, saves a brood of eaglets from a dragon, he is eaten up by the hasty mother eagle on her return. But, as her eaglets weep at the sight, she spits him out again. In the end he calls upon his treacherous comrades to join with him in shooting arrows straight up into the air by way of ordeal. His arrow strikes the ground before him, but theirs fall back upon their heads, and they die."†

Lebrun says, quoting from Thevenot's "Voyage in the Levant," that "among the Turks people may be seen seated on the ground with a number of books spread on the ground round them. They take four arrows cut to a point, and place them in the hands of two persons. Then they place upon a cushion a naked sword and read a certain chapter of the Koran, during which these arrows fight together, and victory is divined to the party after which the victorious arrows are named, and they never go to war without trying this mode of divination." The Koran probably refers to this in the chapter which says, "O, true believers, surely wine, and lots, and images, and divining-arrows are an abomination of the work of Satan; therefore avoid them that ye may prosper."‡ In the preliminary discourse (p. 127) we are told that the arrows used for this purpose were like those with which they cast lots, being

* "Gipsy Folk Tales," von Dr. Franz Nuklosich.

† *Academy*, July 10th, 1875.

‡ Sales "Koran," v. p. 24.

without heads or feathers, and were kept in the temple of some idol, in whose presence they were consulted. Seven such arrows were kept in the temple of Mecca, and were found in the hands of Abraham and Hobab by Mahomet; but generally in divination they made use of three only, on one of which was written, "My Lord hath commanded me;" on another, "My Lord hath forbidden me;" and the third was blank. Divination by means of arrows was practised by Nebuchadnezzar (Ezek. xxi. 21), and Potter tells us that this superstitious practice of divining by arrows was used by the ancient Greeks and other nations.*

There would appear to have been a certain amount of sacredness attached to arrows among the Mexicans, although it is not stated that they were used in divination, for Bancroft† says of the festival of the month Quecholli, dedicated chiefly to Mex-coatl, god of the chase, "Canes were gathered and carried to the temple of the god of war. There young and old assembled for four days to share in the sacred work of making arrows. The arrows were all of uniform length, and were formed into bundles of twenty, carried in procession to the temple of the god, and piled up in front of the idol."

The description given of the divining-arrows serves to connect them with the very smooth, straight sticks which the Alani women are described by Herodotus (iv. 67) as gathering and searching for anxiously, and also with those bundles of myrtle sticks with which the Persian magi, according to Strabo (xv. cap. 3, p. 136), touched their sacrifices, holding them in their hand during their prayers and incantations. These twigs were also held before the perpetual fire on their altars as an act of worship, and there is a very obvious connection between both these and that very ancient and well-nigh universal practice of casting lots.

Among the Anglo-Saxons lots consisted of pieces of wood from a fruit-bearing tree, which were cast into a white cloth, and this mode of divination, or casting of lots by means of the twig, or tan, as it was called, was common to all northern nations, derived, it is said, from the Scythians. But that which will be of especial interest to the ethnologist is the fact that at the present day the Hottentot children cast lots by twigs as our Anglo-Saxon ancestors did—that is, if a thing is lost or a theft has been committed, they throw bits of stick and judge of the culprit, or of the direction wherein the lost property is to be found, by the arrangement of the twigs, and among the Kaffirs bundles of sticks and assagais are employed by the diviners in their rites for the discovery of crime. Among the South

* Potter's "Antiquities of Greece," vol. i. p. 334.

† Bancroft's "Native Races of the Pacific," vol. ii. p. 335.

African peoples also two bones are still used in casting lots, being evidently the primitive form of dice, which can be traced back in their present form to a very remote antiquity, and which, as well as the divining-rod, are connected by legends with Mercury.

But probably the most important and significant fact connected with the use of rods, twigs, and arrows in divination is their very evident bearing upon the ancient alphabets. It is impossible to look at the primitive alphabets, such as the Phœnician, the Etruscan, and the Runic without being struck with their resemblance to twigs or branches of trees differently arranged.

That a very intimate connection subsisted between the arts of divination by rods or arrows, the casting of lots, and the primitive alphabets cannot, I think, be doubted. It is a significant fact that just in those regions of Asia where arrows were principally used in divination, there we find the cuneiform or arrow-headed characters in use. It would appear to me that both divination and the primitive alphabets originated with that very early semi-civilised race which seems to have spread over the whole world prior to the rise of Aryan supremacy, being generally, although perhaps not very correctly, denominated Turanian, and which, by whatever name it may be designated, has certainly left traces in the language, religion, and customs of almost all nations quite alien to Aryan culture. This race cannot, I imagine, be traced to paleolithic times, but seems to have everywhere superseded the users of rough stone implements, introducing polished stone weapons, and probably at a later period supplementing these by copper tools and a knowledge of the precious metals. For the Aryan races was probably reserved the discovery of bronze and iron, but that the earlier peoples had made considerable progress in the arts of civilisation before the invention of these, cannot be doubted. The first traces of this civilisation in Europe may, I believe, be found in the neolithic caves of France and Belgium and the Swiss lake-dwellings, in which, even where metal is absent, there is abundant proof of a knowledge of agriculture, of the use of garments and ornaments, and of a style of art scarcely to be designated as rude. Perhaps there also may be seen the first germs of that art of divination which is still so rife among non-Aryan races, in the perforated and ornamented horns, which may have been bâtons of command, as already pointed out. That to this primitive people, however they may be designated, may be attributed the invention of letters, or, at least, of those symbolic forms which later became letters, was a conclusion at which I had arrived before I had the honour of

laying this paper before the Anthropological department of the British Association at Bristol, but I had not then had an opportunity of reading Lenormant's work upon the subject ("*La Magic chez les Chaldéens et les origines Accadiennes*"). The perusal of this work has amply confirmed my views, since he traces the arts of divination, and especially the use of the *bâton céleste*, or divining-rod, to an underlying Turanian population in Chaldea, Persia, and among the *Esquimaux*, and says of the cuneiform characters:—"We know with certainty that it was by the Turanian portion of the population that cuneiform writing was introduced into Babylon and Chaldea. The characters are susceptible of two uses—at first the rude drawing of the symbolic image, and afterwards the abstract idea explained by the syllable composing the phonetic value, not in the Assyrian language, but in Accadian—that is, in the idiom of the Turanians of Chaldea. The 180 primitive cuneiform characters also bear testimony to the fact that the Accadians came from another and more northerly region, where the great carnivora and palms were unknown, and confirm the traditions of the people, which relate that their ancestors came from quite another country, the name *Akkad* signifying mountaineer."* But the race which M. Lenormant thus credits with the introduction of magic and the art of writing, as well as metallurgy and other useful arts, and which he believes may be traced, both linguistically and by customs, over the greater part of Asia, and, in prehistoric times, over Europe also, seems to me, by the same process of reasoning, traceable not only in those portions of the world, but also undoubtedly in Egypt and among the civilised nations of America. Bancroft gives many instances of a divination similar to that of the Accads. He says: among the *Zapotecs* "each form of divination was made a special study. Some professed to foretell the future by the aid of stars, earth, wind, fire, or water; others by the flight of birds, the entrails of sacrificed victims, or by *magic signs and circles*."† It would appear to me evident that, in some cases at least, the magic rods carried by the gods and by their priests originated the primary symbolic alphabets, which seem always to have had a sacred character. Whether any of these can be traced to the stone age is perhaps doubtful. M. Lenormant, in giving to them a Turanian or Accadian origin, and assigning to them an immense antiquity, does not carry that antiquity into the stone age, for he attributes the invention of the metallurgic arts to the same people, even as I had previously done upon different grounds; and northern archaeologists do not suppose that runes existed before the age of iron,

* "*La Magic chez les Chaldéens*." Par Francois Lenormant; pp. 284-286.

† "*Native Races of the Pacific*," vol. ii.

believing it impossible to have made carvings in stone without the aid of that metal. Nevertheless the rock sculptures of Peru, and others recently discovered in French caves, prove conclusively that such work can be done with implements of copper, or even of stone.* Perhaps the introduction of Woden and Mercury into the legends relating to their invention would confirm the conclusions of Scandinavian antiquaries, but, even allowing that the runic alphabets were introduced by Aryan iron-workers, it will, I think, be conceded that they took for those alphabets signs already well known as symbols of some particular god, or of some natural object; and it must not be forgotten that Woden and Mercury were but Aryan names for a pre-Aryan divinity, even as the arts of magic and divination, of which they were the patrons and supposed inventors, can also be traced to a pre-Aryan epoch, as has been so ably done by M. Lenormant. There can be no doubt that magic is repugnant to Aryan ideas of civilisation, and we find it condemned alike by the laws of Manu and of Moses, as well as by later lawgivers; nevertheless it continues in full force among Turanian peoples and among primitive uncivilised races.

Even in China, Huc says, "the second religion is regarded as that of the *ancient inhabitants*; the priests and priestesses are celibates, and practise magic, astrology, necromancy, &c." Almost everywhere, in fact, these arts may be traced to an aboriginal population, despised as outcasts by the conquering races, yet dreaded for their supernatural power. It cannot be doubted that the art of divination is of immense antiquity, and as the author of the article on 'Divination' in the "Encyclopædia Metropolitana" says: "It seems impossible to assign its origin to any period below the immediate influence of primæval tradition;" and there certainly appears to me some reasons for tracing its origin to the prehistoric cave-dwellers, for the laboriously cut holes in the stag's-horn sceptres before-mentioned have evidently some symbolic meaning, and the traces of magic rites carried on with so much singular uniformity of detail in all uncivilised countries at the present day, and in civilised lands among the aboriginal and outcast portions of the population, seem to prove that these rites originated in that far off period when man had not yet spread himself over the surface of the globe; that, retained in the primitive form among uncivilised races, these rites became developed into an elaborate system in the ancient civilised nations of the world, being blended with, and in fact forming the basis of, their religions, as in Egypt, Chaldaea, Media, Etruria, China, India,

* See *Anthropological Journal*, April, 1875, p. 357.

and Peru, but declining with the advent of the Aryan races, although tolerated in Greece and Rome, and even by Charlemagne, the cross which had from time immemorial served in all countries as a magic symbol significant of power over the elements, and particularly over water, being retained as a sacred Christian sign, and as such used to sanctify the old heathen superstitions, which could not be eradicated from the minds of those who, by descent or by familiar intercourse, may be supposed to have retained a certain amount of affinity with the older races. It is thus that we see faith in the power of the divining-rod surviving among the rustics of Somerset and Cornwall, whilst the casting of lots in some form has a still wider range, having charms probably for many highly educated people. Among the gipsies soothsaying and magic are still in full force, and the belief in ghosts and spirits and in second sight has not yet died out in Scotland and Ireland, nor, if we may credit the papers, has the belief in witchcraft yet become extinct in England.

These remnants of old superstitions cannot fail to be of interest to anthropologists. Their universality seems to prove the unity of mankind. Their retention in spite of the advances of civilisation and the prohibitions of Christianity serve to show how deeply rooted is superstition in the human mind; and, if I am not greatly mistaken, their peculiar prevalence in certain localities may be traced to a greater amount of aboriginal blood remaining in those localities. It is, I believe, a matter deserving of investigation whether the older races do not really possess a power which modern science has hitherto failed to define or to account for. It certainly appears to me, that after making every possible allowance for trickery, the effects of imagination, and of religious excitement, there yet remains a substratum of fact in the marvels related of the old magicians of Egypt and Chaldaea, and in those of their modern representatives in India and elsewhere, as well as in the use of the divining-rod in our own land, which has never yet been satisfactorily explained. It may be that a certain temperament renders the owner more susceptible of magnetic influences, which susceptibility may be inherent in certain races, and more powerful the nearer those races approach to the inferior animals; for it can hardly be doubted that the lower animals are more alive to atmospheric influences than man is. This, however, is perhaps, strictly speaking, a psychological subject, but I feel convinced that it is one which will more and more command the attention of anthropologists also, when engaged in the solution of that most interesting problem, the origin of the human race.

DISCUSSION.

Mr. MUGGRIDGE mentioned that he had in Cornwall, some years ago, visited copper mines in a district where the belief in the powers of the divining-rod was held by a very large number of the educated classes, and was told by a gentleman there of a case where the presence of copper or water was at once detected in a hall where the test was prepared and all collusion prevented. Another case at Mentone was also adduced.

Dr. SPRATT was of opinion that a belief in divination by the rod and by the arrow was always accompanied by good grounds for the same. He mentioned cases of persons suffering from rheumatism and neuralgia who were able to trace water by the sensation of damp. He also considered that there are evidently certain nerves connected with the brain that appear to become more active if over-pressed with local irritation, and if some are lost, as the sight or the power of hearing, their loss is partially made up for by the other nerves becoming more active.

Mr. IVER MACDONNELL quite agreed with the remark in Miss Buckland's paper, that "it would appear as if some special peculiarity existed in those persons with whom the divining-rod acted," and mentioned a case which he had witnessed, in which a person claiming to have a sense of the presence of water, had given proof of his ability in this respect. In another case a French lady, introduced by the late Archbishop of Dublin, Dr. Whately, had controlled the movements of a compass.

Mr. PIDGEON considered that the antiquity, use, and probable origin of this extensive form of superstition should be discussed, rather than the credit to be assigned to any West country story of wonders effected by divination. He also referred to a case of unsuccessful divination by the arrow in Virgil's "*Æneid*," Book v. l. 485.

Miss BUCKLAND, in replying briefly, regretted that the discussion should have taken so decidedly a *psychological* turn, as the chief aim of her paper was to prove the antiquity of the use of the divining-rod, and not the reality of the supposed power claimed by the users. Believing it to be a remnant of a pre-Aryan superstition, at present existing only or chiefly among non-Aryan races, its survival among the peasantry in Somerset and Cornwall, where, if anywhere, we may expect to find traces of the aboriginal inhabitants, she thought might possibly be used as a test of race.

Mr. LUKE BURKE, Major OWEN, Mr. CHARLESWORTH, and the PRESIDENT also made some observations, and the meeting separated.

JANUARY 11TH, 1876.

A. W. FRANKS, Esq., F.R.S., *Vice-President, in the Chair.*

The minutes of the previous meeting were confirmed.

The Director announced the following new elections:—
W. R. CORNISH, Esq., 5, Sunderland Terrace, Bayswater;
ISIDORE B. LYONS, Esq., 9, Finsbury Place, E.C.; H. AUBREY
HUSBAND, Esq., M.D., of Brentwood House, Stroud Green
Road, Finsbury Park, N.; and EDMUND CROGGAN, Esq., Beau-
fort House, Beaufort Road, Clifton.

The list of presents was read, and thanks were voted to the
respective donors, viz. :—

FOR THE LIBRARY.

From the AUTHOR.—The Mythology and Traditions of the Maori
in New Zealand. By Rev. J. F. H. Wohlers.

From the AUTHOR.—Kashmir and Kashghar. By H. W. Bellew,
Esq., C.S.I.

From the "ACADEMY."—Bulletin de la Académie Royale de Copen-
hagen. No. 3, 1874; No. 1, 1875.

From the SOCIETY.—Proceedings of the Royal Society. Vol. XXIV.
No. 164.

From the EDITOR.—Revue Scientifique. Nos. 25—28, 1875.

From the SOCIETY OF ARTS AND SCIENCES OF BATAVIA.—Tijdsch-
rift xxi. afl. 5, 6; do. xxii. afl. 4, 5, 6—xxiii. afl. 1. Notulen
xii. No. 4, 1874. xiii. Nos. 1, 2, 1875. Verhandelingen,
xxxvii. xxxviii.

From F. W. RUDLER, Esq.—The Marriage of Near Kin. By A. H.
Huth, Esq.

From the ASSOCIATION.—Proceedings of the Geologists' Associa-
tion. Vol. IV. No. 5.

From the SOCIETY.—Journal of the Royal Asiatic Society of Great
Britain and Ireland. Vol. VIII. Part I.

From the EDITOR.—Nature (to date).

The following paper was read by the author :—

*On the PROBABLE ORIGIN of the MAORIS or NATIVE INHABI-
TANTS of NEW ZEALAND.* By W. S. W. VAUX, M.A., F.R.S.

It has been long a problem, and, I may add, one not yet satis-
factorily solved, whether the Maoris are autochthonous, and if
not, what was the country whence they originally came?
Much speculation has arisen on this subject, not, perhaps,
always of the wisest kind, and many theories have been ad-
vanced which, on more careful investigation, cannot be sustained.

As I have been induced by my friend, Dr. Hector, to take much interest in this question, and to look into it with some minuteness, especially from the language point of view, he has asked me to accompany his remarks on the stone implements he has brought from New Zealand with a short preface, stating the judgment my researches have led me to form on the "whence" of the Maoris. I propose, however, that this brief paper shall be, in the strictest sense, a preface to what is to follow from him, as to go into details on so wide a subject would require even more than one long evening. Moreover, the Society would, I feel sure, prefer hearing, from Dr. Hector's own lips, his account of the stone implements he has to show, with the views of their relative dates and uses, which appear to him, from his long and practical experience of the habits of the existing population, to be the most likely.

I shall not, therefore, now discuss these remains, and shall merely add the *one* remark, that I doubt the possibility of deducing any conclusion as to the remote or recent origin of the Maoris from any such monuments, the more so, that both of the two great classes, the rude as well as the highly polished, are met with, at least occasionally, side by side, under the same conditions, in the same old native camping-grounds or settlements, this fact, as it seems to me, clearly showing that they must have been in use, synchronously, by one and the same people. That they were used for very different purposes is equally certain from their wholly different character and conformation. I shall, therefore, confine myself to some other points which are, perhaps, rather more in my province, and shall, thus, be less likely to anticipate what Dr. Hector may presently have to say.

Now, it seems to me that there are *three* sources from which we might hope to gain some information as to the origin of the Maoris, viz. :—

1. Their traditions.
2. Their ethnology and customs.
3. Their language.

To take, *first*, the *Native Traditions*. On this head it is enough for me to state here, that, among these, there is a very general and remarkable uniformity, pointing to this definite conclusion, that, according to their beliefs, their ancestors came from the N. and N.E., and but few at a time, the names of even some of the canoes in which they arrived having been preserved. It is, further, a curious fact that there are still existing families in the islands who put forward a claim, not contradicted by the others, that they are lineal descendants of the first-comers. The most common name they give their primeval home is Hawaiki, a name found variously modified in

more than one of the islands of the Polynesian group,* the natural inference from this fact being that it belongs to some remote place, possibly that of their earliest origin, and has, thus, been handed on from island to island. I may add that, according to a persistent tradition, resting, as in the similar case of Owhyhee, on the genealogies of the families of known chiefs, the Maoris would not seem to have occupied these islands much more than 500 years; and, further, that there is no evidence whatever for the idea, propounded by Mr. Colenso and others in the Transactions of the New Zealand Institute, that any other race occupied these islands before their arrival here. No remains have been found, during the ample investigations of recent years, giving any colour to this notion, nor have the closest observers detected the prevalence of any custom, which might have served to distinguish the Maori of 500 years ago from those of the present day, still less, either of these peoples, from the earlier but hypothetical race who, if they had lived in New Zealand, need not, for this reason, have been the ancestors of the present Maoris.

I cannot, of course, in so elementary a paper as the present, presume to offer any *proofs* of what I myself firmly hold, viz. the almost certain truth of the Maori traditions, the more so that, in the lecture which is to follow, Dr. Hector will no doubt refer to them, and with an authority to which I have no claim. I may, however, state that, so far as I have been able to examine into them, I think the evidence in their favour conclusive. I pass, therefore, on to the *second* portion of this paper,

The Ethnology and Customs of the Maoris.

And, here, I am bound to admit that, at first sight, there is a considerable difficulty, if we are compelled to hold that the colour of skin, the outline of features, or the nature of the hair are, in themselves, enough to constitute a well defined variety of the *genus homo*, for, unquestionably, in external appearance, there is among the Maoris the widest diversity of features, some of

* It seems worth while to note the curious modifications of form under which this name is found. Thus in Cook, 1 Voy. iii. p. 69, we find it called *Heawige*, evidently an error of English origin. In the islands themselves the following forms occur:—1. *New Zealand*—Hawaiki; 2. *Rarotonga* and *Mangarwan*—Avaiki; Tahiti, Hawaii; Sandwich, Hawaii (the native name of the island we call "Owhyhee"); Marquesas (like the New Zealand Hawaiki); Samoan, Savaii. It is quite clear that each and all these forms are dialectical variations of some one original, but what that original was we do not know, perhaps never shall ascertain. It is a curious fact that in many of these islands the word simply means "below," corresponding with the *inferno* of other countries, the idea of the people clearly being, as is expressed in several of the legends, that their chief god fished them up from the bottom of the ocean and thus made their homes dry land.

them being almost European in their physiognomy, while others, again, have the high forehead and Roman nose of the North American Indian. There is also an almost equal diversity of colour from the darkest swarthinness to the fair types of the European. All and each of these points may be well seen in some photographs Dr. Hector has collected, in illustration of part of his lecture. Hence it is not strange that Dr. Höchstetter and others should have called the existing natives a *mixed* race, and should have strongly urged the probability that there has been, at some period or other, a considerable infusion of Melanesian blood. To this view, however, I venture to think that the perfect unity of the Maori language is an adequate reply; for though, as might have been anticipated, there are many dialectical differences between the speech of the various tribes dwelling from the north to the south promontories (over a distance of some 13 degrees of latitude), the *common* language of the Maoris, which is better known and has been more carefully studied, than that of any other of the Pacific Islanders, with the possible exception of the Hawaiian, is perfectly homogeneous, with scarcely any words (and these chiefly the import of commerce) assignable to any other tongue. Mr. Thomson has, I think, detected only about 100 words, Malay or of Malay origin, out of the 6,000 to be found in the latest New Zealand dictionary, a dictionary, however, which, it is no injustice to its compilers to state, is far enough from being a thesaurus of the language. Judging by the examples I have seen, there is not nearly as much difference between these local dialects as we find, at the present moment, between the speech of a Yorkshire or a Somersetshire man. Now it would seem scarcely possible, certainly not probable, that, supposing the Maoris the *mixed* race they have been asserted by some to be, not one single word of any other people, except the few Malay words I have referred to, should be found in their current spoken language. Few instances occur of the intermixing of two or more *wholly unlettered* populations, whether by conquest or otherwise, without many words having been preserved belonging, respectively, to the conquered or the conquering peoples.

With regard to their *customs*, I think it may be stated that, with the exception of the cava-drinking, of which we read so much in Mariner's "Tonga Islands," those of the Maoris differ but little from what we find prevailing in the other Polynesian groups—such as the Navigator's, Friendly, Society, Marquesas, and Sandwich Islands—the natural conclusion being, that the inhabitants of New Zealand and the islands I have just mentioned were, at some time or other, much more directly connected

than they are at present; and this conclusion, it will be observed, is wholly in unison with the tradition of the Maori immigration from the N.E. Again, in all, or nearly all of these islands we find the recognition of one or more superior beings, not without some resemblance to the deified heroes of classical antiquity, together with the prevalence, at least formerly, of human sacrifices, infanticide, and cannibalism, the practice of tattoo, and the institution of tabu. In some of the islands, and markedly in New Zealand, there is a total absence of images and of any edifice that could be called a temple, and in most of them, with the exception of New Zealand, their Paradise is supposed to be in a remote island to the N.W.

I learn from Dr. Hector that the Maoris excel greatly in the practice of weaving, that their practice in this art is exceedingly ingenious and peculiar, that they show much taste and skill in the patterns of the cloths they produce; and that the art of carving in wood, for which these islanders are justly famed, is confined to a certain class, and handed down from father to son. I learn, too, that it is usual, when any peculiarly good work is required, to send from one end of the island to another to secure the services of some of the *tohungas* or skilled artificers, who are themselves, individually, well known.

It would be of great interest could we trace on the continent of Asia, or in the adjacent islands, any manufactured work nearly resembling that of New Zealand, and for this purpose I studied, so far as I was able, the interesting collection now in the India Museum at South Kensington. I regret, however, possibly from my own negligence or defect of eyesight, that I did not detect any specimens from India or the Indian Archipelago exhibiting an accurate resemblance to the work we are entitled to attribute to the native inhabitants of New Zealand. It is, however, extremely difficult to feel sure about the *provenance* of individual objects, and I am, therefore, quite prepared to learn that I passed over, from ignorance, some objects about which I ought to have had no doubt. There is, however, one custom common to many of the other islanders which we do not find among the Maoris, and this is the use of bows and arrows. In New Zealand bows and arrows are not used as weapons of offence and defence, or employed for war purposes, though, as we know from recent fatal examples, they are common enough to the N.W. among the Melanesian and Micronesian populations.

In the *third* portion of this paper, *the Language of the Maoris*, and, on the amount of affinity it has been said by many writers to have with the dialects of other islands in the

Pacific, I am able to speak with considerable certainty, having devoted all the time I could spare, during the last six months, to the study of the leading languages of Polynesia, the Maori, Tonga, Tahiti, and Hawaii, with reference, when I had the opportunity, to the works of William v. Humboldt, Buschmann, Moerenhout, and other travellers.

In this inquiry it is right that I should mention that Mr. Thomson, of Otago, to whom I have already referred, has, three or four years since, instituted many interesting and successful comparisons between the Maori, Malagasi, Tongan, and Malay, respectively, and has published the results at which he has arrived in an able paper in the sixth volume of the "Transactions of the New Zealand Institute, 1873."

The general conclusion I have formed from these studies (and it is obviously not possible for me to give on this occasion either proofs or details) is that all the languages of Polynesia, with the exception of the Tongan and the Fiji (or Viti, as it is more correctly called), are closely connected, both in structure and vocabulary; and, further, that the differences exhibited by the Tongan and Viti, due in each case, I suspect, to Melanesian influences, are, nevertheless, not such, as to exclude them from being *bonâ fide* Polynesian. And secondly, that there is, in each of them, a certain connection with the Malay and Javanese groups of languages, but by no means so intimate a connection as many able philologists have asserted. I think, therefore, that there is no doubt but there once was a distinct Polynesian language, and that this language, in the course of things, and, after the lapse of a period of time we have no data whatever for calculating, has been broken up and left as we find it now in the different groups of the Pacific Islands which I have mentioned.

It will be observed that, if this theory be true, the question as to the "whence" of the Maoris is largely widened out; for, in the face of the close resemblances, any student of comparative manners or of comparative philology will find in each and all of these islands, it is, practically impossible to produce any satisfactory evidence, to show that what is prehistoric in one of them is not equally so in all the rest.* In fact, the question really becomes this, What is the origin of the Polynesians? It is clear that we cannot isolate Hawaiian, Tahitian,

* It has, I am aware, been a favourite view of several writers that the respective antiquity of the different groups on the islands they now inhabit can be shown from the character of their present alphabets, and it has been supposed that, as those to the N.E. and extreme E. of the Pacific—the dwellers, for instance, in the Sandwich Islands or Easter Island—have fewer consonants in their language than the Samoans or the Maoris to the W., the eastern people must, on the theory of the whole of the Polynesians having immigrated

or Maori, though it is probable that the modification these dialects have undergone, and possibly, too, the marked varieties now noticeable in their physical features, suggest the intervention of a very long period of time since the ancestors (whoever they were) common to *all* these peoples dwelt together side by side.

Now, we know that the Polynesians belong, wholly, to that division of mankind who are termed the "yellow men," as distinguished from the "white," or so-called Caucasian races, and the "black," or Negro and Melanesian; moreover, that, physically, they are evidently far superior to either Melanesian or Micronesian. Their prevailing tint is light to dusky brown, with a tinge of yellow, though, as I have said, many of the New Zealanders, and a large proportion of the Sandwich Islanders, are very dark. Still there is scarcely found among them the woolly or crisp hair universally associated with the negro, nor, except rarely, the long, lank hair, the prevailing type of the Malay populations. I ought to add that one of the leading characteristics of all true Polynesians (and in this they stand in marked contrast to the black races) is their love of wandering and of navigating. Many well known and recent instances can be adduced of canoes found in the open sea more than 1,500 miles from the islands whence they had started, and, yet, the occupants of these canoes were not starving, nor, apparently, in any distress.

Now, the leading races of yellow men in Asia are the Turanian Mongols, and I confess, therefore, I think the view I have just sketched out fairly points to a descent of the island populations we now call Polynesian, at some remote period, from the great plains of Central Asia, where still dwell great numbers of a similar type of people. It is quite reasonable to suppose that the necessities of an over-population, or some other agency we cannot now trace, which, in prehistoric times, urged the same people westwards to overrun some of the fairest lands of Eastern Europe, may have induced others of them, either before or afterwards, to force their way to the eastern shores of the Pacific Ocean. Indeed, for such a descent, Nature has herself provided the way; for what better course could be found for the onward march of nations than such great streams, as the Brahmaputra, the Irrawaddy, the rivers of Siam and Canton, and more than all, the mighty Yang-tze and Hoangho? The greater of these

from Asia, have been the first to arrive where they are now, and must, therefore, be the oldest inhabitants of Polynesia. Now, though it is quite true that many dialectical forms still surviving in the W. are not found in the E., and also that the mythology of the W. is comparatively simple and spiritual, while that of the E. is debased and cruel, I cannot say that I am prepared at present to accept either of these views as conclusive as the relative antiquity of the different islanders.

streams ascend into the heart of Asia to the very homes and centres of the Mongolian population, while the lands along much of their course is known to be richly fertile. If we conceive, what was probably the case, a series of waves of emigration, at considerable intervals of time and by different rivers, there is no difficulty in supposing that, when the different groups of emigrants met again a long period afterwards, after having traversed thousands of miles of ocean from their original homes, they would not recognise one another as families who had been once akin. Unlettered populations would not draw the inferences as to origins and ancestries, which are easily discerned by the comparative philologists of Europe.

I believe, therefore, that some such theory as this is sufficient to account for the substantial unity of all the Polynesian dialects, and to account also for the proportion of Malay words and forms detected in some of them. I cannot admit that these languages are *derived* from the Malay, but it is, on the other hand, not improbable that the tribes we now call Malays, descending, originally, also, from Central Asia, did follow the S.E. line of the Brahmaputra, Irrawaddy, &c., while the larger bodies of the Polynesians followed the course of Chinese rivers, at a period long anterior to the Malay descent, gradually crossing the Pacific by the stepping-stones of the innumerable islands to be found between the 20th and 25th parallels of N. latitude. Nearer than this I fear we have little chance of getting.

On CERTAIN EARLY FORMS of STONE IMPLEMENTS in use among the INHABITANTS of NEW ZEALAND. By JAMES HECTOR, M.D., C.M.G., F.R.S.

DR. HECTOR, before describing the collection of New Zealand and Chatham Island Stone Implements, which he exhibited, referred to some points in the ethnography of the Maori race not mentioned in the foregoing paper. He dismissed as untenable the theory that some persons advanced, of the Maoris being autochthones, or a remnant of a former race now represented by isolated groups, through the submergence of a great continental area, and expressed his acquiescence with Mr. Vaux respecting the origin of the Maoris as migrants in common with other Polynesians, but thought that this general way of dealing with the subject rather avoided than settled the issue of greatest interest to the New Zealand student, which is the period of the first settlement of the islands by Maoris, and whether the whole Maori population had a common origin from one migration.

According to the census of 1874, the number of Maoris in New Zealand was 45,470, of whom 43,538 dwell in the North Island, and only 1,932 in the South Island and other adjacent islands.*

This disproportion in the numerical distribution of the Maoris is no doubt due to the more favourable conditions in the north for their open-air mode of life, and for the cultivation of the few simple vegetables which, with fish, form their staple food, the difference of climate between the extremes of New Zealand being nearly equal to that experienced in passing from the South of Italy to the North of Scotland. This disproportion must always have existed, and the little known of the history of the occupation of the South Island shows that it was colonised from the North Island by numerous warlike migrations, and that the Maoris settling in the south soon degenerated both in habits and in physical appearance, so that they might be taken for members of a distinct race. In the North Island, on the other hand, the population has increased until the country was fully occupied; but during this increase certain original divisions of the people have been preserved, so that there are now eighteen distinct tribes, each with subordinate "hapus," which maintain their individuality of interest to a marked degree. For instance, each "hapu" has its own traditional titles to land so well defined that special Native Land Courts have been constituted in the colony for their investigation and conversion into documentary titles.

The testimony given by old Maoris during these trials about events of generations past is stated to be perfectly harmonious, and there is no reason to doubt the truth of their traditional history, and to refer the whole of it to the class of poetical myths, as maintained by Schirren and others.†

The same language is spoken by all the Maoris, though with

* General census, including estimates of certain tribes.

| | Males. | Females. | Sex not stated. | Total. |
|-------------|--------|----------|-----------------|--------|
| N. I. | 23,308 | 19,458 | 772 | 43,538 |
| S. I. | 1,055 | 877 | — | 1,932 |
| Total | 24,363 | 20,335 | 772 | 45,470 |

Selected census from accurate returns respecting thirteen friendly tribes in the North Island.

| Males. | | Females. | |
|-------------------|-----------|-----------|-----------|
| Under 15. | Above 15. | Under 15. | Above 15. |
| 6,079 | 11,209 | 5,225 | 9,132 |
| Total Males | | 17,288 | |
| „ Females..... | | 14,357 | |
| Total | | 31,645 | |

—*Parliamentary Papers for New Zealand, 1875.*

† "Die Wandersagen der New Seelander, 1856." Quoted by Hochstatter.

local dialects, of which the Moriori, or Chatham Island dialect, is the most distinct. The chief mental peculiarity of the Maoris is their acute power of comparison, which is more highly developed than is usual in uncivilised races. From this circumstance their vocabularies are extensive, and even trivial objects, such as useless plants, receive the same names throughout the islands. This was considered to indicate that the language of the earliest observers in the country was still in use, and that there must have been free communication, probably round the coast, ever since the first occupation of the islands.

It was pointed out, that though the traditional stories of the Maoris may be in the main accepted as true, yet it is not likely that we have a complete history. Our recorded knowledge of the language and traditions is chiefly derived from missionaries and other experts in a few localities, and relates chiefly to such matters as the inquirers were themselves most interested in. This is an important consideration when it is sought to use the early collected traditions as negative evidence, while it is obvious that no traditions collected during the last thirty years, since the diffusion of European ideas and education, should be accepted as proving an absence of knowledge of events or objects on the part of the natives.

Apart from traditions, however, much can be inferred concerning the past history of the Maoris from observation. When the country was first settled by Europeans, some thirty-five or forty years ago, there were still evidences that in their primitive state the islands of New Zealand were covered with forest or dense scrubby vegetation, but that from large areas, where a dry climate prevailed, the original vegetation had been removed by numerous burnings. This process has been carried on by the Europeans, so that except where excessive moisture stays the destruction—as, for instance, on the west coast—the country is converted into open pasture land. On the charred surface of the country the first Europeans found everywhere bones of the moa birds plentifully strewn. The Maori term “moa” includes 18 or 20 different species of birds of stuthious habit, some of massive proportions, and having a stature of 10 feet. As first clearly proved by Mantell, the destruction of these gigantic birds was effected by the Maoris, and the remains of their feasts on these birds are to be found in all favourable places round the coasts and up in the interior. When Mr. Mantell was commissioner for the purchase of the south-east district of the colony, where these moa birds formerly abounded and were last exterminated, certain natives claimed title to the land, on the ground that it was their ancestor that first set fire to the country when engaged in hunting moas. There can be no doubt that the chase of the moas

must have attracted a large number of Maoris from the North Island after it was fully settled and food had become scarce; and the extent of their hunting encampments only prove that the work of extermination was effected with great rapidity, and that the natives at that time had more the habits of Nomads than now, when they are tied down to their cultivations.

The same kind of change of custom took place a second time when certain tribes in the north were supplied by the Europeans with firearms, but the game was then their fellow-men.* The date of the final extinction of the moa, the speaker thought, must be very recent, from the frequent discovery of remains, with skin and flesh attached, almost exposed on the surface. These, no doubt, were straggling survivors, but it is clear that the moas must have been coeval with the forests still existing on the western slope of the mountains, and that their destruction must have followed as an immediate consequence of the arrival of Maoris in any district.

He expressed his dissent from Dr. Haast's theory, that the *moa hunters* were an anterior and different race of people from the Maoris, or that the moas were destroyed by a race of *autochthones* that inhabited a post-pliocene continent that has since been reduced to islands.† This theory has been much canvassed in the colony, and it is only supported by the alleged absence of any traditional knowledge of the moa among the Maoris, and on the ground that the stone implements of the Maoris evinced a higher state of development towards civilisation than those of the moa-hunting natives. The first supposition is negatived by the testimony of the best Maori scholars, such as Judge Manning, who has been admitted to all the knowledge of the *Tohungas*. Also by Sir George Grey, Mantell, and by the circumstance that the moa is described from native report in Polack's work on New Zealand, written before the existence of the large bones was discovered by the European settlers.

With respect to the stone implements, the collection on the table shows that the rudest forms found with the moa bones in New Zealand occur also in the Chatham Islands, where no moa bones have been found. There they are used by the Morioris, a tribe now almost extinct, that lived until late years in caves and rude huts, exposed to most inclement weather, with only a scanty supply of fuel, there being no

* "Life in Banparah;" by W. T. L. Travers, F.L.S. Trans. N. Z. Inst., vol. v.

† Tr. N. Z. I., iv. 84, et seq. That author has considerably modified his theory in subsequent publications, but in his latest he states that "he has no doubt but that his views expressed some years ago will gain general acceptance." Id. vii. 81.

large trees on the islands. They subsisted chiefly on fish, and the flesh of seals and cetaceans, and clothed themselves in skins. Their canoes were made of the flowering stalks of the *Phormium tenax*, or New Zealand flax. They had all the appearance of a race that had suffered physical degradation, the marks of which are to be seen even now in their crania, but it is generally conceded that they are in language and every other respect a branch of the Maoris. They use the flakes now exhibited for cutting flesh, but at the same time used heavy polished adzes for cultivating their potatoes; and this is the only difference between the common stone implements found in the old moa-hunter encampments and the gardens round the *pahs* of the modern Maoris, where they even yet use agricultural implements of stone.

Referring to a communication to the Society by Dr. Haast (J. E. S. ii. 10), in which certain stone implements were described as of high antiquity, owing to the position in which they were found imbedded in gravels on the west coast of New Zealand, Dr. Hector stated that if the description was correct these would certainly far exceed in antiquity any other human works that had been found in New Zealand, but he had exactly the same form of implements on the table which were found, also on the west coast, by his friend Mr. Harvey, the District Judge, at the root of a tree. Now, trees are in that district frequently burrowed under by kiwis (*Apteryx*) and kakapos (*Strigops*), large nocturnal ground birds, and the holes which they make are just such places where valuables like stone implements would be laid and lost by travelling parties of natives. As the gold-diggers (one of whom found the implements referred to by Dr. Haast), in excavating their trenches and "paddocks," as they term the large open pits, undermine the loose shingle from beneath the tough surface of matted roots, a mistake could easily occur through the dropping down of the stone implements from the surface into the workings. But even if found in the gravels in the position described, it might still be more a modern deposit than has been inferred, as changes in the alluvial deposits on that coast take place with great rapidity owing to sudden alterations in the courses of the rivers. The position in the same locality of a large portion of the wreck of a vessel, with metal sheathing and felt between the planks, was described as 300 yards back and three-quarters of a mile up a small creek, proving the rapidity with which coast drifts accumulate.* The successive belts of vegetation, also described in the paper quoted as proving the antiquity of the deposits on which they grow, did not, in the speaker's opinion, represent successive periods of time; the in-

* Hector, Tr. N. Z. I., iv. 373.

nermost *tutu* scrub, for instance, being indicative of a filled up watercourse which probably ran parallel with the much older beach deposit with its scanty scrub.

The implements and other evidences of human design found in New Zealand were therefore, according to the speaker, to be referred to a time equivalent to the most recent period in the history of other countries. They also show signs of relationship to similar articles in the South Sea Islands, and yet can generally be distinguished at a glance. The chief novelties exhibited were the flakes and wedges, many of the former being of obsidian, which is only found on a small island in the Bay of Plenty, but is still carried about by the natives in blocks for the manufacture of cutting-flakes. In the earliest hunting encampments and on the Chatham Islands these same flakes are found. The other flakes are made of flint, chert, and a quartzite from a tertiary formation that is found in the interior. Also some flakes made by a single blow from a rounded boulder, which are identical with those found in the brocks of Shetland. Among the large adzes or grubbers was the cast of an enormous specimen, found by Captain Fraser in Otago, measuring eighteen inches, and weighing $11\frac{1}{2}$ lbs. The stone of which this and most of the common tools are made is a fine-grained metamorphic sandstone of green colour. Among the implements exhibited was a fine weapon made from the jawbone of a sperm whale, and identical in form with the *rapa* or double-headed paddle of the natives of Easter Island; also a very ancient wooden *mere* or war-club, known as *rangitiki*, which was given to Dr. Featherston, N. Z. C., as a token of the cession of the large block of land where the Fielding settlement has now been established. The chief interest of this *mere* is that the figure carved on it has five fingers instead of the ordinary three fingers and reflexed thumb of usual Maori carvings.*

DISCUSSION.

Mr. E. B. TYLOR mentioned, in confirmation of Dr. Hector's view, that the Maoris were contemporary with the moa, a native story describing gigantic birds in terms evidently drawn from recollection of the living moa. He proceeded to ask whether the tradition of the first arrival of the Maoris in the canoes Arawa and Tainui seemed to be consistently related and true, and whether the natives thought the island to have been previously uninhabited. With reference to the theory of Mr. Thomson, that the connection of language between Madagascar and Polynesia was to be accounted for by these regions having been

* A series of the stones, worn by the wind so as to resemble human workmanship, were also exhibited from Lyall Bay, near Wellington. (Trans. N. Z. I., ii. 247.)

once joined by a continent now mostly submerged, Mr. Tylor remarked that his idea was that of the submerged continent of Lemuria, the existence of which Professor Sclater had suggested on other grounds. But so far as the connection of race and language between Madagascar and New Zealand, &c., was concerned, it appeared to the speaker that this could be quite sufficiently explained on the ordinary view of an immigration of Malayo-Polynesians in canoes to Madagascar, and that to demand a submerged continent for the purpose of accounting for it, was to bring in a vast and venturous theory to explain a small and ordinary fact.

Dr. SPRATT was led to suppose that the peculiar aptitude of the Maoris in defining substances, character, and objects, and readily distinguishing them by giving characteristic names, was not only a law of nature peculiar to New Zealand, but to all human beings where education did not exist. Thus the same power of discrimination might be traced to animals and human beings when they were void of sight, deaf, or dumb, that the nerves peculiarly suitable for given purposes became more active; thus blind people, by the sense of touch, have been known to show signs of remarkable *instinct*, which, in fact, as the *mind*, is simply the action of one, or the combination of several nerves, which again constitute the power of *thought*. Domesticated animals and human beings, through education and new channels being opened to them for occupation, by natural affinity dispense with that portion of the faculty that constitutes "the natural power of definition," and by books, paper, and pens they are able to note a larger amount of knowledge than may be accumulated and retained in memory by mere observation of some striking and attractive points, from every individual change, and appearances of living animals, human beings, plants, atmospheric changes, &c. Some interesting facts appertaining to this subject he is collecting, and will shortly submit them to the Chairman.

Dr. HECTOR and Captain FRASER answered that the Maori tradition of the arrival of the canoes at the island had the appearance of truth, but that the natives seemed to think that there were already people on the islands.

Captain FRASER and the CHAIRMAN also joined in the discussion.

Dr. HECTOR exhibited a large series of stone, wooden, and bone implements, which he had recently brought from New Zealand, in illustration of his paper.

The Director announced the appointment of Auditors of the accounts to be, on behalf of the Council, Mr. CHARLES HARRISON; on behalf of the members, Mr. JEREMIAH; and the meeting separated.

ANNUAL GENERAL MEETING.

JANUARY 25TH, 1876.

Colonel A. LANE FOX, *President, in the Chair.*

The minutes of the last Annual Meeting were read and confirmed.

The Director having read the circular convening the meeting, the Treasurer submitted the Financial Statement for the year ending December 31st. (See next page.)

On the motion of Mr. FORBES, seconded by Mr. DES RUFFIÈRES, the Statement was adopted.

The President appointed, as scrutineers of the Ballot, Mr. G. M. Atkinson and Mr. R. B. N. Walker, and declared the Ballot to be then opened.

The Report of Council for 1875 was read by the Director, as follows :—

REPORT of COUNCIL of the ANTHROPOLOGICAL INSTITUTE of GREAT BRITAIN AND IRELAND for 1875.

THE Institute has held fifteen ordinary meetings, one special, and one anniversary meeting during the year, at which the following communications were read :—

1. On the Anthropology of Prehistoric Peru. By Mr. Consul T. J. Hutchinson.
2. On the Andamans and Andamanese. By Dr. George Dobson.
3. On the Basque and the Kelt. An examination of a paper by Mr. Boyd Dawkins, F.R.S., on the Northern Range of the Basques, in the *Fortnightly Review*, Sept. 1874. By the Rev. Wentworth Webster, M.A.
4. On the Milanows of Borneo. By Lieut. C. C. de Crespigny, R.N.
5. Further Notes on the Stone Monuments of the Khasi Hills. By Major Godwin-Austen.
6. Anthropology at the Congress held at Stockholm, 1874. By H. H. Howorth, Esq.
7. History of the Heung-Noo, part 2. By H. H. Howorth, Esq., and A. Wylie, Esq.
8. On Ultra Centenarian Longevity. By Sir Duncan Gibb, Bart., M.D.
9. On the Chest Measurement of Recruits. By Colonel A. Lane Fox.
10. On Molecules and Potential Life. By Rev. Dunbar I. Heath, M.A.
11. On a Prehistoric Road in Antrim. By G. H. Kinahan, Esq.
12. On the People of the Long Barrow Period. By Professor George Rolleston, F.R.S.
13. On the Height and Weight of Boys aged 14, in Town and Country Public Schools. By Francis Galton, Esq., F.R.S.
14. On the Origin and Progress of the Malagasy. By Rev. Joseph Mullens, D.D.
15. On the Quissama Tribe of Angola, West Africa. By J. J. Monteiro, Esq.
16. On Mythology. By Moncure D. Conway, Esq.
17. On Language and Race. By Rev. A. H. Sayce.
18. On the Beothues of Newfoundland. By T. G. B. Lloyd, Esq.
19. Description of two Beothue Skulls. By Professor George Busk, F.R.S.
20. On the Stone Implements of Newfoundland. By T. G. B. Lloyd, Esq.
21. On the Long Wall of Salona. By Captain R. F. Burton.

22. On the Ruined Cities of Pharia and Gelsa di Lesina, in Dalmatia. By Captain Richard F. Burton.
23. On the Comparative Psychology of Man. By Herbert Spencer, Esq.
24. On the Natives of Central and Western Australia. By John Forrest, Esq.
25. On the Papuans of New Guinea. By Captain John A. Lawson.
26. Short Notes on Heredity in Twins. By Francis Galton, Esq., F.R.S.
27. A Theory of Heredity. By Francis Galton, Esq., F.R.S.
28. Report on the Anthropological Department of the Bristol Meeting of the British Association. By F. W. Rudler, Esq., F.G.S.
29. Report of the Exploration Committee of the Anthropological Institute on the Excavations in Cissbury Camp, Sussex. By Colonel A. Lane Fox.
30. Remarks on the Animal Remains discovered in the Excavations. By Professor George Rolleston, F.R.S.
31. On the Belief in Bhutaa—Devil and Ghost worship in Western India. By M. J. Walhouse, Esq.
32. On the Localities whence the Tin and Gold of the Ancients were derived. By C. O. Groom-Napier, Esq.
33. On the Weddars. By Bertram F. Hartshorne, Esq.
34. Note on a proposed International Code of Symbols for use on Archaeological Maps. By John Evans, Esq., F.R.S.
35. On Divination by the Rod and by the Arrow. By Miss A. W. Buckland.

Thirty-five ordinary members have been elected during the year.

His Majesty the Emperor of Brazil, his Majesty the King of Siam, and his Excellency Don Manuel Pardo, have been elected honorary members, and Dr. Benham corresponding member.

Twenty-four ordinary members have withdrawn since the last anniversary.

The Institute has lost, through death, Mr. Cornish Brown, Mr. T. P. Tindale, Mr. F. Hindmarsh, Mr. W. Sloan, Dr. O'Callaghan, Rear-Admiral Sherard Osborn, Lieut-General John Briggs, Sir Edward Ryan, Mr. Charles Tuckett, Mr. W. Gillespie, Mr. C. C. Green; Canon Kingsley and Sir Charles Lyell, honorary members; and M. D. Omalius d'Hallo, corresponding member.

The following are the names of donors to the Library and Museum during the past year:—

The Royal Society; the Editor of *Nature*; the Asiatic Society of Bengal; Francis Galton, Esq., F.R.S.; Editor *Revue Scientifique*; Hyde Clarke, Esq.; Messrs. Longmans and Co.; Imperial Society of Naturalists, Moscow; Smithsonian Institution; Anthropological Society of Paris; Dr. Paul Broca; Society of Biblical Archaeology; Royal Geographical Society; Geologists' Association; Liverpool Literary and Philosophical Society; Glasgow Philosophical Society; Registrar-General of New Zealand; East India Association; James Burns, Esq.; Henry P. Le Mesurier, Esq.; Editor of *Cosmos de Guido Cora*; Prince L. Lucien Bonaparte; Vienna Anthropological Society; Captain Harold Dillon; Professor Boyd Dawkins; Karl A. Zittu; Editor *Archiv für Anthropologie*; T. E. Pickett, Esq.; Royal Academy of Sciences, Amsterdam; John Evans, Esq.; Royal United Service Institution; the India Office; Imperial Academy of Sciences, Vienna; Academy of Sciences, Cracow; Society of Arts and Sciences, Batavia; the Canadian Institute; the Swedish and Norwegian Legation; Social Science Association; the Rev. James Graves; Edward W. Cox, Esq.; Joseph Milligan, Esq.; Berlin Anthropological Society; Dr. John Shortt; Rev. T. F. Falkner; the

Secretary of State for India in Council; Professor P. Mantegaza; Luke Burke, Esq.; Rev. W. O. Lukis; Royal Academy of Copenhagen; Asiatic Society of Japan; Royal Society of Northern Antiquaries; Professor F. V. Hayden; Executors of the late Henry Christy, Esq.; John Brent, Esq.; Captain R. F. Burton; Mr. Jackson; Captain S. P. Oliver; Anthropological Society of Spain; Messrs. Chapman and Hall; Royal Society of Literature; Society of Antiquaries of Scotland; Dr. Cuthbert Collingwood; American Philosophical Society; Royal Society of Victoria; Imperial Academy of Sciences, St. Petersburg; British Association for the Advancement of Science; Watford Society of Natural History; Boston Society of Natural History; Dr. Eldridge Spratt; T. Squire Barrell, Esq.; Society of Antiquaries of London; Asiatic Society of Great Britain and Ireland; Royal Institution of Cornwall; Royal Colonial Institute; the Devonshire Association; M. Valdemar de Mainoff; Professor George Rolleston; Rev. W. Carruthers; W. Pengelly, Esq.; A. R. Wallace, Esq.; W. M. Gabb, Esq.; Dr. I. Kopersnicki; the Right Hon. Lord Arthur Russell; Rev. J. F. H. Woblers; H. W. Bellew, Esq., C.S.I.

On the motion of Mr. DUNN, seconded by Mr. CHARLES-WORTH, the Report was adopted.

Several matters connected with the internal management of the Institution were discussed, and

The following Council and Officers of the Institute for 1876 were announced by the Scrutineers as having been elected:—

President.—Col. A. Lane Fox, F.S.A.

Vice-Presidents.—Prof. Geo. Busk, F.R.S., John Evans, Esq., F.R.S., A. W. Franks, Esq., M.A., F.R.S., Francis Galton, Esq., F.R.S., Geo. Harris, Esq., F.S.A., E. Burnet Tylor, Esq., F.R.S.

Directors.—E. W. Brabrook, Esq., F.S.A., Capt. Harold Dillon, F.S.A.

Treasurer.—J. Park Harrison, Esq.

Council.—J. Beddoe, Esq., M.D., F.R.S., W. Blackmore, Esq., Sir Geo. Campbell, K.C.S.I., F.R.S., Hyde Clarke, Esq., J. Barnard Davis, Esq., M.D., W. Boyd Dawkins, Esq., F.R.S., Robert Dunn, Esq., F.R.C.S., David Forbes, Esq., F.R.S., Charles Harrison, Esq., F.R.S.L., H. H. Howorth, Esq., M.A., Prof. T. McK. Hughes, F.G.S., Prof. Huxley, F.R.S., A. L. Lewis, Esq., Sir John Lubbock, Bt., F.R.S., F. G. H. Price, Esq., F.R.G.S., J. E. Price, Esq., F.S.A., Prof. Rolleston, M.D., F.R.S., C. R. Des Ruffières, Esq., F.R.S.L., Lord Arthur Russell, M.P., M. J. Walhouse, Esq., F.R.A.S.

The following was the PRESIDENT's address:—

I now proceed to offer a few observations upon such points as appear most worthy of your attention on the occasion of the present anniversary meeting.

In doing so I shall be guided by the consideration that the ordinary meetings held throughout the year suffice for the introduction of new facts, and for discussing the various

branches of anthropological science which are brought before the Institute.

At those meetings we are, however, debarred from considering questions relating to internal administration, which are, nevertheless, of great importance to the progress of our science. I shall therefore avail myself of the only opportunity afforded me of laying before you views on the organisation, policy, and future prospects of the Institute, upon which it appears desirable to invite the expression of opinion and co-operation of the members.

I will not, however, so far deviate from the custom of my predecessors as to omit all mention of the many valuable and interesting papers which have been read and published during the past year, and the more so, as the year terminating with the publication of the present month, has been remarkable for the value of the communications contributed to our Journal.

Before doing so I wish to say a few words upon a subject of no slight importance to the clear comprehension of ideas, as well as to the division of labour so necessary in the organisation of our Society. I allude to the terminology to be employed in the classification of our subjects.

My predecessor, Professor Busk, with whom it has been my good fortune to co-operate on so many occasions, employed in his Anniversary Address a fourfold classification, dividing the subjects of the previous year into—1. Ethnology. 2. Pre-historic or Priscan Archaeology. 3. Anthropology proper; and 4. General works or essays relating to Ethnological subjects.

This classification, although otherwise unobjectionable, appears to me not well adapted to our existing organisation, inasmuch as it restricts the employment of the term Anthropology to a branch of our science instead of using it comprehensively to designate the whole. A classification which necessitates the adjunct *proper* to one branch of our subject, in order to distinguish it from other branches of a less strictly anthropological character, can only be regarded as a provisional arrangement; nor do I suppose that Mr. Busk himself in-

tended it to be regarded in any sense as a final system of classification.

I am well aware of the inconvenience arising from the use of new terms, and am prepared to admit that if, on the first formation of the Institute, we had adopted a title that was shorter and better known, we should have doubled our members before now.

But it is now too late to retrace our steps in this direction, nor would the doing so serve any useful purpose at the present time. Anthropology has been born anew in the Institute, and the term is becoming generally accepted by the public; and unless we intend to abandon it as the title of our Institute, it is, I think, to be regretted that any of our members should continue to use it in the restricted sense of what is now known as the Biology of Man; the more so as biologists are often credited with adherence to special doctrines that are not accepted by all. It cannot be too widely known that the formation of a special school is quite inconsistent with the principles on which the Institute is organised, and that Anthropology, as a science of man, whilst it embraces the widest field of subjects, admits of the utmost freedom of treatment that is consistent with a scientific regard for the value of evidence.

In any attempt to classify our papers under broad scientific headings we are met at once by the difficulty of deciding whether our classification shall be by subjects or by workers. If, for example, we wished to make a twofold division of our subjects, we should find that all branches of anthropology might be arranged under the two terms *Biology* and *Sociology*, corresponding to Constitution and Culture—the first relating to man as a member of the animal kingdom, the second to the development of human institutions. But it would be found, in practice, that a large number of our papers contained both biological and sociological matter, and could not, therefore, be distinguished under these headings. Or, if we wished to arrange our subjects under headings which would include the different classes of workers amongst our members, we might divide them into *Inductive* and *Deductive*. But here, again, it would be found that a number of our papers, being both Induc-

tive and Deductive in their contents, could not be adapted to this nomenclature.

It appears, therefore, better to abandon all attempt at primary classification, and, whilst retaining the use of these general terms for such papers as cannot properly be referred to any of the subdivisions of them, to adopt in our classification the use of such expressions as have grown into use in practice, and more particularly such as have been employed by cognate societies to designate those subjects which are properly branches of our science. By this means we shall at the same time pave the way for absorbing their members into our own body, and forming a strong society, which is so much needed.

Commencing with our inductive branches, we have two, which, in all anthropological investigations, are necessarily allied, viz. :—

1. Descriptive Ethnology; and 2. Archæology, representing the present and the past—the former consisting of papers by travellers and others, descriptive of the people visited, their institutions and arts; the latter referring to the past history or relics of those people. It is the support which the former of these two branches affords to the latter, by interpreting the past by the present, the unknown by the known, which constitutes the peculiarity of our inductive method and entitles the anthropologist to a standing in the ranks of science.

With respect to Archæology, we are concerned chiefly with the prehistoric part of it; but it seems desirable we should come to a better understanding as to the exact meaning of the terms Historic, Non-historic, Prehistoric, and Proto-historic, which are so variously employed by different writers. By some the term historic is held to represent throughout the world all that space of time which is subsequent to the first dawn of authentic history in Europe, but the practical impossibility of referring events in uncivilised lands to this standard renders the use of the term quite ineffectual in a definite chronological sense. It is better, I think, to use it only as expressing the degree of reliance that is to be placed upon our knowledge, as being conveyed to us by means of written records, and that in every country the term historic should be applied only to the

period of the authentic and continuous history of that country. It will be seen that I here adopt Mr. Boyd Dawkins' definition of the term, distinguishing the historic period of each country, as that of which we have continuous and connected narratives, rather than that of which we have only fragmentary notices. In the same way, non-historic should in each country refer only to such events or monuments as, being of the period of authentic and continuous history, as above defined, are not recorded in such histories.

Then, again, it has been proposed to limit the term pre-historic to the period immediately preceding the dawn of history, including the neolithic, bronze, and iron periods, or what is known to archæologists as the surface period, and thereby distinguishing it from the drift or palæolithic period of the geologist. But I hold that it is liable to create confusion to employ, in a restricted scientific sense, a term which is etymologically of broader signification, and which must continue to be employed, vulgarly, in a broader sense. The word prehistoric must be generally understood to mean all that term of human existence upon the earth, whatever its duration may have been, which preceded historic times, and it ought, I think, to be scientifically accepted in this sense.

The word proto-historic has been applied to the borderland between historic and prehistoric, and relates to matters not as yet referred to the domain of history, and of which our knowledge is either fragmentary, or derived from local inscriptions, hieroglyphics, or traditions, which are accessible only to a few, or of doubtful import, and including much of what has lately been treated under the name of Biblical. Here we are reminded, by the success of an important branch of anthropology, which has flourished of late years under that name, of the importance of adopting a popular nomenclature when practicable. This branch of proto-historic archæology has been almost wholly lost to us, owing to the skill and energy with which the Society of Biblical Archæology has been worked; but it would probably be for the advantage of both societies if an interchange of ideas could be established between us.

We come next to (3) Ethnology, by which name we may

now understand all racial questions, papers relating to the origin, identity, or influence of race, and which is distinct from descriptive ethnology, being deductive rather than inductive, and including usually a different class of workers.

After this we have (4) Biology, comprehending all general biological papers which cannot be referred to either of its two subsections—viz. (5) Comparative Anatomy, and (6) Psychology. Whatever views individuals amongst us may entertain as to the subjects which should be included under the head of Psychology, we require no better authority for including it as a branch of our science than Mr. Herbert Spencer's communication to the Society on this subject, and the fact that a separate Psychological Society has been established during the past year, numbering many members, the majority of whom might have been gained to the Institute if we had exercised a little more foresight in relation to this branch.

Finally, we have (7) Sociology, which properly includes—but which, for practical purposes, should be kept distinct from—its subsection (8), Philology.

I now proceed to classify the papers read before the Institute during the past year under these headings, terminating with the contents of the "*Quarterly Journal*," published on the 1st of this month, and commencing with a corresponding period in the preceding year. In each class the papers are taken in the order in which they were read.

DESCRIPTIVE ETHNOLOGY.—*Nine Papers.*

1. A note by myself, on the "Resemblance between the Arrows used by the Talamanca Indians of Costa Rica and those of the Indians of Brazil," inferring social connection.

2. A paper by Mr. M. G. Walhouse, on the "Korāgars of South Canara, West Coast of India." They are especially remarkable for the custom of wearing an apron of leaves over their buttocks by the women. In former times this appears to have been the only covering of both sexes, and it is now retained as a survival, the women wearing the apron over their other clothes, and believing that to discontinue the custom would be unlucky. They are proverbially truthful, their word

being accepted even by so suspicious a people as the Hindoos, a fact which the author mentions as an exception to the assertion of Mr. J. S. Mill, that savages are always liars, and have not the faintest notion of truth as a virtue. Many of the customs of these people are remarkable, more particularly that which precludes them from taking up or holding any animal or object that has four legs.

3. On the "Andamans and Andamanese," by Mr. G. E. Dobson. The author concurs with Mr. Wallace in connecting these people especially with the woolly-haired Samangs of the Malay Peninsula, and believes that they are also connected with the Dravidians of India, being a branch of the great dark race of mankind, which in ages past occupied the lands south of the Himalayas. None of the tribe visited exceeded 64 inches in height, and the author was especially struck with the relatively small size of the females. They are a singular example of brachycephalic negroes. Several excellent photographs accompany this paper.

4. A paper by Lieut. De Crespigny on the "Milanows of Borneo," which, on account of the resemblance of their religious customs, he believes to be descended from the same ancestors as the inhabitants of Timor, and the Moluccas, and also the Kyans, but he does not think that any of these are the aborigines of the country.

5. A "History of the Heung-Noo in their relations with China," translated from the Chinese, by Mr. A. Wylie. This is a continuation of a paper in the third volume of our Journal, and does not admit of a brief abstract.

6. A paper on the "Origin and Progress of the People of Madagascar," by Dr. Joseph Mullens, Foreign Secretary to the London Missionary Society. In this paper the author disputes the theory put forward by Mr. Crawford and others, who considered the main body of the Malagasy to be of African descent, and the Hovas to represent an infusion of Malay blood. Dr. Mullens thinks that the whole of the inhabitants of the island are of Malay origin, but slightly tainted with African connection. Their language he considers to be more closely allied to the Malaya branch than to the Javanese, or Bali.

The difference of complexion observable amongst them he attributes to local causes, the coast tribes inhabiting the hot feverish provinces being of darker skin than the inhabitants of the central plateau.

7. "An Account of the Quissama Tribe of Angola," by Mr. J. J. Monteiro. After 300 years of constant intercourse with the white race these people are still a savage and untamed tribe, but they are not cannibals. They are small, ugly, and dirty in their persons. Their social connection with other races in different parts of Africa is shown by the employment of small polygonal blocks of rock salt as a medium of exchange, a custom frequently noted in other African tribes.

8. A paper describing sundry relics of the Beothucs, aborigines of Newfoundland, by Mr. E. G. B. Lloyd. They are described as a handsomer race than the Micmacs, having more regular features and aquiline noses, less dark in the skin, of middle stature and active build. Amongst other relics discovered was an iron European axe, which had been transformed, by great labour, to their own peculiar shape; thereby adding another to the many recorded instances of the inveterate conservatism of savages, especially in regard to the forms of their tools.

9. A paper by Mr. John Forrest, the Australian explorer, on the "Natives of Central and Western Australia." The innumerable sub-tribes are divided into two great divisions, called Tornderup and Ballarook—these are exogamous. A Tornderup must marry a Ballarook, and *vice versa*—those who break the rule are generally killed. They wear no clothes, but grease themselves instead. They suffer much from cold, and, although they might easily make rugs of kangaroo and wallaby skins, they do not do so. They eat almost everything, and their capture of wild animals is much facilitated by the scarcity of the watering-places, to which the animals are obliged to resort. Mr. Forrest adds but little to our knowledge of their arts and implements, beyond confirming the fact that the same forms prevail with but slight variation all over the continent. Circumcision is universal, and it is a sort of religious ceremony. Cannibalism is common, and from the scarcity of graves, the

author having only seen two in all his travels, he infers that they frequently eat their dead. Should this be confirmed, it will perhaps be supposed to throw some light on the question so frequently asked by prehistoric archaeologists of the races of the stone age—What became of the great mass of their dead?

ARCHÆOLOGY.—*Seventeen Papers.*

1. A paper by myself, noticing the identity of the forms of arrow-heads discovered on the banks of the Rio Negro, Patagonia, with those found on the surface throughout the United States, forms which are nevertheless peculiar to America.

2. A note by Mr. C. Cotesworth, on mortuary towers in the neighbourhood of Palmyra, believed to be some 1,800 or 2,000 years old. One of them was 30 feet square and 74 feet high, containing mummies of the dead. These towers have a curious resemblance to certain mortuary towers in Peru noticed by Mr. Squier.

3. A note on "Some Peruvian Antiquities," by Mr. Bollaert.

4. A paper on "Tumuli and Stone Circles near Castleton, in Derbyshire," by Mr. Rooke Pennington. The author believes that, in Derbyshire at least, no connection can be established between the neolithic age and contracted burial, and the bronze age and incineration. The two customs were in force at the same time; both existed in the stone age, and both continued in vogue after the introduction of bronze. Mr. Pennington also gives his reasons for supposing that many of our megalithic circles, especially the larger ones, are not sepulchral, but devotional.

5. A note by Mr. Park Harrison, in which he points out the existence of Phœnician characters, reversed, on tablets inscribed on the convex surfaces of bamboos, in the island of Sumatra. This communication, though short, is important, and there appears to be very little doubt that the connection assumed by Mr. Harrison, in so far as the form of the letters is concerned, has been established.

6. A paper on the "Anthropology of Prehistoric Peru," by Consul Hutchinson, in which the writer gives his opinion that

the aboriginal South Americans were the oldest people on the American Continent, and also that the civilised life of the ancient Mexicans and Central Americans may have had its original beginning somewhere in South America, most probably in Peru, as it seems more closely related to the ancient South Americans than to the wild Indians north of the Mexican border.

7. A paper by Mr. Harold Dillon on flint implements, consisting of flakes, scrapers, celts, and arrow-heads, found on the surface near Ditchley, in Oxfordshire. The writer's observations on the distribution of these implements tends to establish their connection with some ancient dykes of considerable extent which exist in the neighbourhood.

8. A note on some stone mining tools discovered in ancient copper mines, consisting of surface workings at Alderley Edge, in Cheshire, by Mr. Boyd Dawkins, in which he points out the resemblance of these tools having a lateral groove for a withy, to others found in prehistoric copper mines elsewhere.

9. Some further notes on the "Rude Stone Monuments of the Khasi Hill Tribes, near Shillong," by Major Godwin Austen. Many will regret to read in this paper of the destruction of some of these monuments by our own camp followers, and the remark that the European is in this respect more destructive than the Hindoo. Major Austen takes care to qualify this remark, by saying that he refers to uneducated Europeans. It is perhaps too much to expect that the servants of a government which cannot be persuaded to protect its own prehistoric monuments should pay much respect to those of a savage race; but India has hitherto been highly favoured by the establishment of an archæological survey, an example which might be followed with advantage at home.

10. On "A Prehistoric Timber Road at Ballyalbanagh, co. Antrim," by Mr. G. H. Kinahan. Judging by the growth of peat, the writer estimates the age of the oak forest at 5,000 years, that of the deal forest at about 2,000, making the road-way about 3,000 years old.

11. On the "Stone Implements of Newfoundland," by Mr. Lloyd. Most of the forms found on the surface appear to be of

the ordinary North American types. Some of the concave tools for working rounded objects attracted special notice.

12. A note on some hieroglyphic tablets from Easter Island, by Mr. Park Harrison. These were of the usual character from that island, and have not been deciphered; but it was noticed that there were connections between the forms, and that whilst some were clearly pictographic, others appeared to have passed into a symbolic stage, which suggested the advisability of an attempt to classify them.

13. Some Antiquities from Hissarlik, the supposed site of Ancient Troy, were exhibited by Mr. Bertram Hartshorne.

14. A very valuable paper, by Professor Rolleston, "On the People of the Long Barrow Period." Amongst other noticeable points in this paper is the result obtained by the author as to the height of the skeletons. That of the males averaged 5 feet 6 inches, whilst the females averaged 4 feet 10 inches. This is a greater difference than is observable between the sexes in modern times. On the other hand, the difference in the size of the skulls of the sexes is less in prehistoric times than amongst civilised races, and in this respect the stature and skulls of modern savages accord with those of prehistoric times. As regards the mode of burial, he says the immense majority of the long barrows in the South of England were erected for inhumation, whilst exactly the reverse of this has been the rule in northern counties. On the whole Professor Rolleston inclines to the belief that indications are not wanting to suggest that inhumation will ultimately be shown to have been the earliest mode of burial in these the earliest of known sepultures; but this and other points treated upon in the paper are, he thinks, in need of further evidence for their definite solution, and are beset with numerous difficulties and sources of fallacy.

15. A paper on the "Long Wall of Salona and the Ruined Cities of Pharia and Gelsa de Lesina," by Captain Burton, who believes them to be the work of the civilised Greeks, not the barbarous Illyrians, and to be of pre-Roman origin. Time does not enable me to give to this communication the space it deserves in the review of our proceedings.

16. A note by Mr. Horace Woodward on the discovery of a

wooden image and bronze spear-head, at depths of 15 and 20 feet respectively, in the river gravel of the Teign, near Newton Abbot. The surface of this gravel deposit was but 4 or 5 feet above the present river, so that the objects themselves were considerably below that level. The gravel is classed by the author amongst the most recent accumulations of the river, and contemporaneous with the alluvium.

17. Excavations in Cissbury Camp, Sussex, being a report of the Exploration Committee of the Institute for the year 1875, by myself. These excavations have confirmed in a satisfactory manner the opinion that the shafts and galleries were made to obtain flints for implements, by showing that the same seam of flints was worked from different shafts. They have proved beyond doubt that the shafts and galleries were older than the ancient British camp in which they are situated. The camp has also been shown to be of pre-Roman times. The flint mines are of the neolithic age, and two different modes of working them were employed. A skeleton of a female of the age of the mines was discovered in the bottom of a shaft, the dolichocephalic skull of which confirms the opinion of Professor Rolleston, already referred to, as to the relatively large size of female heads in prehistoric times. These excavations will probably be considered of value hereafter, on account of the very conclusive nature of the evidence they afford.

ETHNOLOGY.—*One Paper.*

We have but one paper on deductive Ethnology, as I have defined the term, viz.:—one on the Basque and Kelt, by the Rev. Wentworth Webster. The paper contains much valuable information, but is limited to an attempt to disprove the views of Mr. Boyd Dawkins, which he had published in the *Fortnightly Review*, as to the presence of an Iberian race allied to the Basques in Armorica and other parts of Western Europe. The paper gave rise to an animated discussion, which, owing to our system of obtaining reports from the speakers themselves, we have been able to publish in full. It was shown clearly that the Basques, though now speaking one language, consisted of two very different races, the one tall, fair, and brachycephalic,

the other short, dark, and dolichocephalic, both probably belonging to the earliest inhabitants of Europe, which had been driven by subsequent waves of immigration, the one northward and the other southward, into these mountains, where they have retained to this day the distinctive racial peculiarities of their ancestors. The question of language as a test of race was freely discussed by Mr. Sayce, Mr. Rhys, Mr. Hyde Clarke, and Prince Lucien Bonaparte.

BIOLOGY.—Five Papers.

1. A paper by Sir Duncan Gibb, on "Ultra-Centenarian Longevity," more particularly on the case of a gipsy of the name of Elizabeth Leatherlund, who lived to the age of 112.

2. "On the Height and Weight of Boys, aged Fourteen, in Town and Country Public Schools," by Mr. Francis Galton. The result is that boys of this age in the country group are about $1\frac{1}{4}$ inch taller than those in the town group, and 7 lbs. heavier. No proper abstract of this paper can be given: it includes several tables of measurements which must be studied in order to be understood.

3. "Short Notes on Heredity in Twins," by Mr. Francis Galton. Mr. Galton finds with regard to 94 cases of twins, of whom he had sufficient returns, that they had a total of 1,065 uncles and aunts, and that amongst these there were 27 sets of twins; in other words, there were twice 27, or 54 persons who were severally one of a pair of twins amongst the 1,065 uncles and aunts—say 1 in every 20. In the population generally the proportion is much less, being only 1 in 50.

4. A "Theory of Heredity," by Mr. Galton. It is impossible to give in a few words any summary which will do justice to this paper. The following will, however, suffice to give an idea of the theory.

He assumes as an admitted fact, that every body consists of a multitude of organic units, and that this hypothesis must necessarily be at the foundation of a science of heredity. He employs the word "*stirp*," from *stirpes*, a root, to express the sum-total of the germs, *gemmales*, or whatever they may be

called, which are to be found in the newly fertilised ovum, that is, in the earliest pre-embryonic stage.

He then puts forward four postulates, viz :

(1) That each of the enormous number of quasi-independent units of which the body consists has a separate origin or germ.

(2) That the stirp contains a host of germs, much greater in number and variety than the organic units of the bodily structure that is about to be derived from them, so that comparatively few individuals out of the host of germs, achieve development.

(3) That the undeveloped germs retain their vitality ; that they propagate themselves while in a latent state, and contribute to form the stirps of the offspring.

(4) That the organisation wholly depends on the mutual affinities and repulsions of the separate germs, first in their earliest stirpal stage, and subsequently during all the processes of their development.

In this way he accounts for the known fact that a man is capable of transmitting a variety of ancestral peculiarities to his children that he did not himself possess, that diseases are sometimes found to skip a generation ; and also he accounts in this way for the assumed fact, which, however, will, I apprehend, be the point in the paper least likely to receive general acceptance—viz. the almost complete non-transmission of acquired peculiarities.

5. A paper on the "History of Twins," by Mr. Galton, which is reprinted, with revisions and additions, from *Fraser's Magazine*.

It may, perhaps, be considered favourable to the correctness of the classification which I have adopted, that, without premeditation on my part, nearly all the papers which come under this head of Biology, as distinct from its two sub-branches of psychology and comparative anatomy, are contributed by one of our members. It is to be hoped that we shall not have to wait until the principle of heredity has asserted itself in Mr. Galton's offspring before we have other contributors to this important branch of our studies.

COMPARATIVE ANATOMY.—*Four Papers.*

1. "On Some Skulls from the Mortuary Towers at Palmyra," already referred to, by Professor Busk. These, Mr. Busk says, are of interest, as confirming the fact that "the people whose remains they represent, at whatever period they existed, were a robust, dolichocephalic race, certainly having no relation to the Mongol type, and, in all probability, distinct at any rate from the Hebrew branch of the Semitic stock."

2. A "Note on Five Lapp Skulls," by Dr. Simms. Dr. Simms believes that the long arms and proportionately small size of the legs in the Lapps are the result of use and disuse consequent on their habits of boating and sledging.

3. A "Note on the Chest-measurement of Recruits," by myself, in which it is shown that the difference between the measurement taken horizontally across the nipples, and that taken obliquely under the shoulder-bones, is from $\cdot 53$ to $\cdot 7$ of an inch, and that it is relatively greater in recruits of small stature.

4. A paper on two Beothuc skulls, by Mr. Busk, giving the details of measurement.

PSYCHOLOGY.—*One Paper.*

1. "The Comparative Psychology of Man," by Mr. Herbert Spencer. This is a classification of the leading divisions and subdivisions under which the comparative psychology of man may be arranged. It is put forward in the view that the study of psychology has not yet received the attention it deserves in our deliberations, and it is intended to be a means of clearing our ideas, so as to enable us to approach the subject systematically. The importance of this branch of inquiry is every day forcing itself on the attention of our members, and it is hoped that it will lay the foundation of a sound study of psychology in connection with the Institute. The paper is itself in such a condensed form that it is impossible to give a satisfactory abridgment of it, and I can only recommend all the members to read it carefully.

SOCIOLOGY.—Two Papers.

1. "Early Modes of Navigation," by myself; being an attempt to trace out the development of this branch of art by means of survivals in different savage races.

2. On "Mythology," by Mr. Moneure Conway. Mr. Conway's treatment of the subject is based on the idea that myths are the degenerate survivals of early religions. This view of the subject is, I believe, perfectly consistent with that of evolution, if we regard myths in the light of drooping branches derived from the upward-growing stem of intellectual progress. On no other hypothesis, save that of the supernatural origin of religious ideas, can this view be accepted.

PHILOLOGY.—Two Papers.

1. A note on the "Language of the Andamanese," by Mr. Hyde Clarke, in which he attempts to connect the Mincopic language with those of other parts of the Southern hemisphere.

2. "Language and Race," by the Rev. A. H. Sayce. The main result arrived at in this paper is that language is a test of social contact, not of race. When there are traces of two or more languages in the same language, or when two distinct races have the same tongue, you can infer, with absolute certainty, that there has been social contact; but when such traces are not to be found, we are not justified in inferring that there has been no such contact. Language, he maintains, is in a constant state of flux.

The foregoing is a *résumé* of the work of the past year, in which I have not, I believe, omitted to notice a single paper.

It has been sometimes said that the main fault of our Society is over-specialisation. I cannot concur in this opinion. The papers which have been noticed show, I think, a fair amount of generalisation. The time which members are able to devote to anthropology is limited, and the division of labour must be maintained. Provided always that our deductions do not exceed the limits warranted by our facts, I see no evil in confining our separate investigations within such limits as can be satisfactorily

dealt with. Unless we are able to devote the close attention to each branch of anthropology which the requirements of science demand, special societies will be formed, which, separating themselves from us, cause waste of power, narrowness of interests, and promote specialisation in its worst form.

The policy which I would advocate for the future of the Institute is to maintain, as far as practicable, intimate relations with branch societies, to take every means in our power to facilitate the election of their members, and, in case of a change of quarters, to promote the union of as many of them as possible under one roof. By this means the Institute, embracing, as it does, the whole of them within the range of its subjects, would come to be regarded as a focus in which specialists might meet and exchange ideas.

Without doubt the ultimate achievement of anthropological science is the recognition of general laws. But experience proves that, in the existing state of our knowledge, few persons are competent to deal with so large a subject. The anthropology of our popular magazines is a caution to us in this respect, serving to show that the most useful function of our Society consists in collecting, sorting, and classifying evidence.

Then again it is our inductive branches which require our more immediate attention. There is ample time before us for generalising if we can first lay in a good stock of facts, but, for doing this, hurry is needed. Aborigines are dying out, or fast changing their customs; and even in civilised countries old landmarks are being removed so rapidly that in a few years the opportunity for collecting information will be lost. It is a great mistake to say, as some have done, that ample materials for our science are already to be found in books of travel. Many of the observations of travellers having been unscientifically made, or observed under the influence of foregone conclusions, are worse than useless. Our anthropological notes and queries will do much for us in this respect, and letters which I have received from the governors of the whole of our colonies to whom they have been sent, show that the matter has been warmly taken up by some of them. What we require, however, is the means of

enabling travellers and other observers to make such investigations and collect such statistics as are necessary for anthropological purposes, and to do this a strong anthropological society is needed. We have received the most friendly assistance from the officers of the Geographical Society at all times, but their means of aiding us is limited. Geography of course takes the precedence in that body, and the same is necessarily the case with the expeditions sent out under their auspices. Much useful information has been obtained, but it is lamentable to think of the opportunities for anthropological investigation that have been lost by some of these expeditions, the main results of which have been to determine which way the water runs in particular places, whilst the flow of human races and of human culture has been made a secondary consideration. It is true that the Arctic Expedition has been furnished with full anthropological instructions, but it is unfortunate that the region selected for initiating these inquiries should be one which is probably uninhabited. The remedy rests in our own hands. If every member would do his best to procure new adhesions, our Society would rapidly increase. Experience has proved that there is no lack of interest in anthropological subjects on the part of the public, and we must seek out the causes which, in times now happily gone by, have made our Society a weakness in the midst of strength.

From the London Missionary Society and missionaries generally we have received valuable assistance, which we may hope will be continued.

The anthropological meeting at Bristol, presided over by Professor Rolleston, was a decided success, both in a scientific and a popular point of view, and was greatly patronised by the clergy. For some years past the work of that department has been conducted entirely by officers of the Institute.

Our Exploration Committee during the past year has been attended with successful results; upwards of £50 has been subscribed by members, whose names are appended. The work of the committee will be continued during the present year. From the British Association we have received £25 towards the cost of future excavations. Several members of the

Sussex Archæological Society have intimated a wish to co-operate with us, and with a small additional subscription from the members of the Institute, it is proposed to commence excavations in the Mount Caburn earthwork, near Lewes, where flint mines, similar to those of Cissbury, appear probably to exist. The consent of the owner, Mr. Brand, has been obtained for this purpose.

The measure admitting ladies to be members of the Institute has also met with the success that was anticipated. No hindrance to our discussion has resulted from their presence at our meetings; on the contrary, it has been observed that the discussions have been unusually well sustained on several occasions. Apart from the slight addition to our members afforded by this means, the effect of instilling anthropological knowledge into the minds of those who are so constantly engaged in the education of children, cannot fail to be regarded as a public benefit.

The success which attended the large public meetings of the Ethnological Society leads us to hope that by pursuing the same course we may increase our numbers, and spread a taste for anthropological studies amongst the public. It appears necessary to the success of such meetings that they should be held in some place that is habitually devoted to scientific purposes. Amongst those causes which hinder the development of our Society must be recognised the popular character of the subjects with which we deal. Whilst the geologist, the zoologist, or the chemist is compelled to go to his Society for an audience, the anthropologist finds willing readers amongst the public at large. Much valuable anthropological matter, therefore, goes direct to the public, instead of passing through our hands. But the importance of upholding the Institute as a focus for scientific criticism cannot be overrated, and I would therefore earnestly appeal to our leading anthropologists to take active interest in the internal affairs of the Society.

We have to regret the loss, I hope only temporarily, of our esteemed Director, Mr. Rudler, he having been appointed Professor of Science at the College of St. Asaph. It has been owing to his unwearying energy, during the short intervals of

time that he has been able to spare from his professional duties, that we are indebted for the regular appearance of our Quarterly Journal on the 1st day of each quarter, a matter of no slight importance to its success with the public.

Should the Institute obtain the development which, with proper management, may be expected, one of its most important functions will doubtless be the publication, in an abridged form, of anthropological facts culled from the proceedings of branch societies at home or abroad; but at present our finances are barely sufficient for the publication of the valuable original matter which we receive. Those, therefore, who desire the appearance of an *Anthropological Miscellany* in our Journal should pave the way for it by increasing our members.

Whilst our external relations have progressed satisfactorily, we have occasionally suffered some inconvenience from internal dissensions. Since the first formation of this Society, in 1844, it has thrown off two branches; but these have either died out, or been re-absorbed into the Institute.

This tendency to return to the fold must be attributed to the freedom of our discussions, and the liberty afforded for the promulgation of all rational views. With the same facts to work upon, reason can but conduct us to the same ends. During the past year I have been urged to initiate negotiations, with a view to amalgamate another anthropological society which, it may be remembered, was set on foot by seceders from our body a few years ago. But whilst expressing every friendly sentiment on the part of the Institute towards those who appeared anxious to return to us, I have not allowed myself to be allured by the promise of a body of new members into taking any steps which might tend to the re-establishment of schism within our council. With the full concurrence of my colleagues, it appeared to me a matter which should be left to be dealt with by the stern law of the survival of the fittest. The result has been that the society of which I speak has come to an end of its own accord. Some of its members have joined our ranks, and others, I hope, will follow, not in a body, but in the ordinary course of admission as Fellows, and will, I doubt not, become useful members of our Society.

Anthropologists may therefore be congratulated upon the present occasion upon being a united body. I hope that we may long continue so. We have a large and ever-widening field of usefulness before us, and our success is certain, if anthropology "do but to itself prove true."

SUBSCRIBERS TO THE CISSBURY EXCAVATION FUND.—Professor Busk, Mr. Hyde Clarke, Professor Boyd Dawkins, Capt. Dillon, Mr. John Evans, Mr. David Forbes, Col. Lane Fox, Mr. A. W. Franks, Canon Greenwell, Mr. J. Park Harrison, Mr. H. H. Howorth, Professor Hughes, Sir John Lubbeck, Mr. F. G. Price, Professor Rolleston, and Mr. G. Willett.

It was moved by Mr. JOHN EVANS, and seconded by Mr. VAUX, "That the best thanks of the meeting be given to the President for his Address, and that it be printed in the Journal of the Institute."

Carried by acclamation.

ANTHROPOLOGICAL MISCELLANEA.

MR. DEANS, who has been employed lately in California as interpreter to some British Columbia Indians, communicates the following, which has not yet appeared in print.

Whilst in California I examined some of the kitchen middens or shell mounds on the shores of the Bay of San Francisco. Some of these are of large dimensions, one, situate near the silk factory in the valley Canda de la Visitacion, six miles south of San Francisco, measuring two acres in extent, and having a maximum depth of 25 feet. Between this one and Point San Bruno are seven or eight others of lesser size; and beyond these again is one with a circumference of 140 yards, and 40 feet in height. These are only some of a great number which lie around the bay. They are composed of oyster, mussel, and other shells, mussels forming a third of the whole, and being also in great numbers in the bay at this date. Bones of the dog, deer, and mountain sheep have also been found, but as yet I have seen no remains of domestic animals.

A large number of mortars and pestles have also been found at all depths from the surface to the bottom. At the foot of the hills of the Sierra Nevada there are hundreds of these mortars hewn out of the solid rock, many of them still having in them the pestles. The large mound already mentioned has been lately lowered 12 feet for the extension of the silk factory, and during the process I obtained from the Chinamen employed on the work many objects of bone, such as pins, awls, and also objects of stone, outlines of some of which are given. Some of the stone objects, it

Fig. 1.



Fig. 2.



has been suggested to me by an old Spaniard, were used in the manufacture of the blankets made from the hair of the mountain sheep mixed with the hair of dogs. I saw two skulls of a brachycephalic type, but very small, though of adults.

Some of the stones seem to have been used as bobbins for weaving, and to have been fixed in the frame by the small ends, as there is still some pitch adhering to the small ends of some of them. The portion next to this is smooth, as though worn by use, and the

other end is rough. Some of these are flat on one side, others round on both sides. No. 1 is of hard, coarse-grained sandstone, and shaped like a humming-top. No. 2 has rosin on the smaller end, and on it marks as of thread; the stone is very smooth. No. 3 is of bone, and appears to have been fixed in wood at the

Fig. 3.

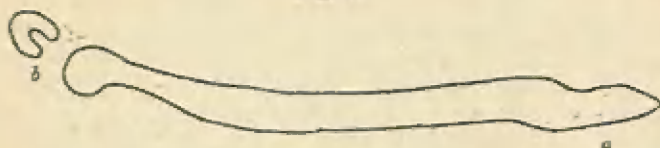


Fig. 4.



smaller end, *a*, whilst at the other end is a notch, shown also at *b*; this notch, which runs lengthwise in the bone, appears to have been meant to guide a thread. No. 4 is an unfinished arrow-head of a greenish flint.

The mortars were some of them of hard black lava, others of granite, and others of hard sandstone. No weapons but arrow-heads have been found. By the side of every skeleton I have found, has been a very hard substance, like tanned leather, and though in small portions only, I have been told of a piece like a shield having been found.

In the before mentioned mound are six layers of ashes, mixed with charcoal of the Californian oak, in this order—first, a layer of ashes, then two feet of shells, then ashes, and so on to the top.

I hope to make further researches at a future date.

Victoria, V.I., March, 1875.

JAMES DEANS.

The following extract is from the *Bermuda Royal Gazette*, July 13, 1875:—

MAN IN BERMUDA.

SOME five or six years ago, as some of our readers will remember, at the instance of Professor Huxley, a number of photographs were taken to illustrate the features and physical characteristics of the people of Bermuda, and were forwarded to England, where they form part of an immense collection illustrative of all the

racés which enter into the vast and varied population of the British Empire. A committee of the British Association for the Advancement of Science has now issued a small volume, entitled "Notes and Queries in Anthropology," intended to promote more exact inquiries, and it has been lately placed, at their request, in the Public Library. It is calculated to show how inquiries and observations, such as medical men and clergy and registrars can readily make, may have results of wide scientific interest, both present and future.

The present small population of Bermuda contains at least six different races, viz. :—

(1) The descendants of Englishmen, and those mostly from the west of England, who came here under the Stuarts.

(2) The descendants of natives of Africa, probably all from the west coast, brought here to servitude many generations ago.

(3) The descendants of Indians of North America, chiefly from Virginia. They seem to be distinguished as *Mustees* in the old laws relating to slaves.

(4) The descendants of Indians, of a different race, from the Spanish Main; all the foregoing have been at least two centuries under the influence of the climate, food, and social conditions of Bermuda.

(5) Portuguese imported from the Western Islands about 1845.

(6) Swedes imported since 1873.

A few individuals of French, Italian, or German extraction need not be counted. Now there are here a comparatively large number of diversities, such as give rise to many questions asked in the book before us, and which, handled by an accurate and close observer, never fail to result in curious and often valuable information. It is not because people may be externally very much alike that there may not exist hereditary characteristics, by which they really differ considerably. It is apparent to every visitor that the original African type here has been very much modified by time and climate, and the refining influence of the kindly domestic service of former days. Even where the complexion is as dark as ever, a perceptible modification of feature has often taken place. The American Indian blood in some coloured families, notably in one, is most apparent. It is even said, by gentlemen who have been on the coast of Africa, that tribal distinctions may be detected.

The questions of the committee, however, are not confined to external appearances, such as complexion, character of hair, shape of head, stature, feature, colour of eyes, facial angles, but also extend to some physiological matters, such as temperament, mental endowments, tastes, preferences, and talents—for example, for music; to the effect of intermarriage, to the prevalence of insanity. Few persons will be found to deny that these are, in their way, as important inquiries in an isolated population of fifteen thousand souls, occupying a small group of islands, as they will no doubt be considered in the Dominion of Canada, which extends across a

continent, but where the difficulties of ascertaining the facts will be much greater; and in recommending the subject, we are permitted to state that any notes or observations addressed to His Excellency the Governor will be communicated by him to the committee, or otherwise applied, as their character may suggest.

The following is extracted from the *New York World*:—

CENTENARIANISM IN CANADA.

DESPITE the extreme range of temperature, a by no means rational diet and eminent neglect of sanitary precautions, the habitants, in very many cases, survive to a great age. Nor should it be difficult to authenticate the claims of a centenarian, since the parish registers have been kept with scrupulous care for periods of far more than a century, many dating back to the conquest of 1760, and some even to the early half of the 17th century. The extraordinary longevity of the descendants of the sturdy old Scotch settlers and German American loyalists of Ontario was sufficiently proved this summer by the grant by the Dominion Legislature of a gratuity to the surviving veterans of 1812. The Government, having ascertained the number of colonial soldiers under arms in that war, and made an average of age that was probably not far from accurate, submitted the problem of a number of survivors to an expert in life assurance. From English tables he decided that there were surviving at the end of the sixty years between six hundred and eight hundred of the veterans; but when they came to distribute the gratuity, some two thousand five hundred claimants proved themselves, by irrefragable evidence, entitled to participation therein, this number not including many whose claims could not be properly substantiated. The result was, naturally, a great reduction of the bounty to individuals. Even allowing that the fact was not sufficiently borne in mind that, fighting with inferior numbers, the people of Upper Canada received many youths into their forces, and that boys brought up on the frontier in those days were qualified to bear arms at a comparatively tender age, and would volunteer, the unusually great difference between the expectation of life and the age actually attained is most significant.

The following has been received from Mr. E. H. O'Callaghan, of Rathmines, Dublin:—

To the Editor of the JOURNAL OF THE ANTHROPOLOGICAL INSTITUTE.

SIR,—A statement appears in your Journal, vol. ii. No. 3, p. 447, to the effect that off the west coast of Ireland, in lat. 54° 8' N., there exists an island whose inhabitants are governed by a king,

who worship a large wooden idol, and who hold little or no intercourse with the mainland. A correspondent, who knows I am a constant student of anthropology, being naturally startled by such a very remarkable statement, drew my attention to it and asked for information.

I have waited very long, hoping that some one who visited the place would write on the subject, but as nobody, as well as I can find out, has spoken, I venture to say that, from the testimony of correspondents living in the vicinity of Belmullet, Mayo, near to which part of the coast Inniskea, the island in question, is situated, there are no facts to justify the exaggerated tale. There is almost daily intercourse between the islanders and the people of the mainland, they resemble each other in usages, dress, and religion, and intermarry to a considerable extent. According to himself, the writer, whose accuracy I question, possesses this advantage over me, that he has been on the island, and has seen the monarch, &c.

I wish the task of discussing this subject had been undertaken by some of my correspondents who have had a similar advantage; but as I believe no refutation has been attempted, I give you the best evidence in my power, and I think it would be highly inadvisable for your readers to credit the story until they shall have seen whether it can bear, like every scientific truth, thorough investigation and discussion.

Dublin, Jan. 23rd, 1876.

E. H. O'C.

Petermann's Mittheilungen for the current month contains a map of the Loango Coast of West Africa, showing the work done in exploration by the German African Expedition of 1873-75. A paper by Dr. A. Schreiber on the country of the Southern Battas of Sumatra is of great interest, especially since the territory they inhabit merges at a yet unknown limit in the north with Atchin, a country which has attracted much attention in its long continued hostilities with the Dutch. Dr. Schreiber speaks with authority, having been resident for the seven years between 1866-1873 in the Batta country. It is only within the most recent years that the darkness which shrouded this inland people of Sumatra has at all been cleared away. They are not negritos of the Australian type, as was at first believed, but in language, derivation, and customs, prove themselves to be a sister nation to that of the Malays, or a branch long separated from that stock. The central home of this people is believed by Dr. Schreiber to be round the borders of Lake Toba, a large highland expanse in the mountainous interior, from which a river flows to eastward. This lake has been recently mapped by the Rhenish missionaries, Leipoldt and Heine.

The narrative of Dr. Couto de Magalhães' journey along the Araguaya river in Brazil is continued, giving much interesting information about the Canoeiras Indians of the river. From the vocabulary collected by Magalhães it appears that their language is pure Guarini.—*Academy*, Feb. 12th, 1876.

REFERRING to the very full and learned paper on Rhabdomaney and Belomaney read by Miss Buckland before the Institute, the subjoined passage from the travels of Pietro Della Valle, a Roman knight, who in the seventeenth century travelled through India and the East, may be not without interest, particularly as giving an instance in which the two kinds of divination are blended, the arrow being used as the rod. In 1625, at Aleppo, Pietro Della Valle relates that he saw a Mahometan conjuror "cause two persons to sit upon the ground, one opposite to the other, and giving them four arrows into their hands, which both of them held with the points downward, and, as it were, in two right lines united one to the other. Then a question being put to him about any business, he fell to murmur his enchantments, and thereby caused the said four arrows of their own accord to unite their points together in the midst (though he that held them stirred not his hand), and according to the future event of the matter, those of the right side were placed over those of the left, or on the contrary."

Some of the instances given by Miss Buckland may be compared with the principal classical passages relating to the practice, which are here given in full.

"There are many soothsayers amongst the Scythians who predict with a number of osier rods in this manner. They bring large bundles of rods, put them on the ground, untie them, and lay each rod apart one by one. They then predict, and whilst doing so, gather up the rods again backwards, and put them together one by one. This is their national way of divination. But the class amongst them called Enareës, which means unsexed men, affirm that Venus conferred on them the power of divining, which is done with three strips of linden bark, a man twisting them round his fingers, and uttering predictions whilst untwisting them."—Herodotus, iv. 67.

Still it is not clear how the responses were decided: probably the rods were marked, as in the following instance amongst the Germans, jumbled together when untied, and taken up from behind with unreverted eyes. The putting them together again, as well as the untwisting of the bark strips, seems also to have been a material point in the operation.

"They (the Germans) make much account of lots and fortune-telling. The method of lots is simple: they cut a rod of a fruit-bearing tree into slips, marked with certain signs, and scatter them at random over a white cloth. Then, if the matter in question be of public import, the priest, or if of a private nature, the head of the family, invoking the gods and looking upwards, takes up three slips one by one, and draws an augury from the marks upon them."—Tacitus, "*Germania*," 10.

The fruit-bearing tree was probably hazel, no other producing straight shoots being easily accessible in the German forests.

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CORRIGENDA.

Page 111, line 6, for "Capt. Pocock," read "Capt. Powell."
 " 127, " 3 from bottom, for "British Fort," read "British Fort."
 " 249, " 2, for "had," read "have."
 " 30, for "probably," read "probable."
 " 382 " 8 from bottom, for "chalk nodule," read "flint nodule."



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